

Fifth Annual Report

COMMISSION OF CONSERVATION
CANADA

1914

Commission of Conservation

*Constituted under "The Conservation Act," 8-9 Edward VII., Chap. 27, 1909,
and amending Acts, 9-10 Edward VII., Chap. 42, 1910, and 3-4 George
V., Chap. 12, 1913.*

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Assistant to Chairman and Deputy Head :

MR. JAMES WHITE

Commission of Conservation Canada

HON. CLIFFORD SIFTON, Chairman
JAMES WHITE, Assistant to Chairman

REPORT OF THE FIFTH ANNUAL MEETING


HELD AT OTTAWA

JANUARY 20-21

1914



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TO FIELD MARSHAL, HIS ROYAL HIGHNESS PRINCE ARTHUR WILLIAM
PATRICK ALBERT, DUKE OF CONNAUGHT AND OF STRATHEARN,
K.G., K.T., K.P., &c., &c., GOVERNOR GENERAL OF CANADA.

MAY IT PLEASE YOUR ROYAL HIGHNESS :

The undersigned has the honour to lay before Your Royal Highness the Fifth Annual Report of the Commission of Conservation for the fiscal year ending March 31, 1914.

Respectfully submitted,

CLIFFORD SIFTON,
Chairman.

OTTAWA, April 3, 1914

OTTAWA, April 2, 1914

SIR :

I have the honour to transmit herewith the Fifth Annual Report of the Commission of Conservation. This contains a report of the proceedings of the Fifth Annual Meeting, held in Ottawa on January 20-21, 1914, in which is included summary statements of the work done under the several committees of the Commission, during the fiscal year ending March 31, 1914.

I have the honour to be, Sir,

Your obedient servant,

JAMES WHITE,

Assistant to Chairman

HON. CLIFFORD SIFTON,

Chairman,

Commission of Conservation.

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WATER CONSERVATION BY BEAVERS IN BRITISH COLUMBIA
Note the beaver dams and the different levels of water in the three ponds.

PROCEEDINGS
OF THE
FIFTH ANNUAL MEETING
OF THE
COMMISSION OF CONSERVATION
HELD AT
OTTAWA, JANUARY 20 AND 21, 1914

THE Fifth Annual Meeting of the Commission of Conservation was held in the Board Room, Temple Building, Ottawa, on January 20 and 21, 1914. The morning session was opened at 10.30 o'clock with the Chairman, Hon. Clifford Sifton, presiding.

Tuesday Morning Session

MR. SIFTON said :

Gentlemen : It gives me pleasure to welcome you to the Fifth Annual Meeting of the Commission of Conservation. It was a matter of great regret on my part, that I was prevented by illness, from being present at the last meeting ; but, under the able direction of my friend, Senator Edwards, the proceedings went on quite as well as if I had been present, and the report shows the valuable nature of the work which was accomplished.

It is my duty to place before you a *résumé* of the work which has been done by the officers and representatives of the Commission during the past year.

WATERS AND WATER-POWERS

**Report on Long
Sault Rapids**

An exhaustive investigation into the project which has been mooted for some time past of damming the St. Lawrence river at the Long Sault rapids for purposes of power development has been completed by Mr. Arthur V. White, and a report has been issued containing the results of his work. This report, for the first time, places within reach of those who are required to deal with the subject, a complete statement of the facts which are necessary for its proper understanding. Apart altogether from the conclusions arrived at by Mr. White, which will

be regarded with respect by all who are familiar with his past work, the collection in systematized form of the information contained in the report was, and is, essential to a proper understanding of the question and to the proper safeguarding of Canadian rights. I have no doubt, therefore, that this investigation and the resulting report will be of great public benefit.

**Waterworks
Systems in
Canada**

A report by Mr. Leo G. Denis has been published, presenting in a form readily available for reference, the principal data respecting the waterworks systems now in existence in the several provinces of Canada. A number of charts and tables are added, summarizing the information in the body of the work and emphasizing points of special interest, such as the growth of the principal systems, sources of supply, rates, cost, consumption, etc. This report is much in demand, especially in the rapidly growing towns and cities of the West, where the necessity of installing waterworks systems is becoming more urgent year by year.

Since the information was collected for this, many new systems have been constructed and additional information in regard to these systems has been secured. A new edition will probably be issued, bringing the information up to date, so as to meet the requests for copies of the report which are constantly being received.

**Information on
Water-powers**

With respect to water-powers, apart from the work of the Long Sault investigation, our work has consisted of investigations in British Columbia and the Prairie Provinces. Our engineer, Mr. Denis, has attended gatherings of the district engineers of the United States Water Resources Branch at Washington, and the Canadian Electrical Association in Toronto. From the proceedings of such gatherings the officers of the Commission are kept in touch with what is going on in the way of power development.

In addition to work of this character, Mr. Denis made a reconnaissance in northern Manitoba, for the purpose of collecting, at first hand, information regarding water-powers in that territory. When this is added to the material already in our possession, we shall have sufficient data to enable us to publish during the coming year a report on the water-powers of the three Prairie Provinces. This, for the first time, will place before the public in convenient form a detailed statement of the water-power resources of those provinces.

The water-power investigation in British Columbia has been the most difficult work in this line that the Commission has undertaken. On account of physical difficulties the progress of survey

parties cannot be rapid, and the expenses of the work are necessarily large. The Province, through the Minister of Lands, the Honourable W. R. Ross, has, however, very generously extended substantial financial assistance during both 1912 and 1913.

Difficulties in Water-power Survey The season during which it is profitable to carry on such a reconnaissance investigation as we have been making is comparatively short. One of the chief difficulties encountered is that it is almost impossible for observers to avoid over-recording power possibilities of streams observed during high stages, and the flood stages in this Province frequently occur much later in the year than they do in Eastern Canada. The conditions affecting powers in this Province are unique, and do not closely correspond to those existent in other portions of the country. Glaciers, melting snow, and heavy rainfall abound, especially on the north mainland coast. Many storage possibilities, known and unknown, exist. While such factors contribute to enhance the value of powers, these conditions require special and very careful engineering investigation and expert handling in order to avoid encouraging developments that might not prove economical.

Special work was commenced in the summer of 1911 in the Kootenays, and, during the working seasons of 1912 and 1913, the work has been pressed ahead, so that, at the close of last year, we had canvassed the larger part of the territory between the International boundary and the main line of the Grand Trunk Pacific. This also includes most of Vancouver island.

Purposes of Power Survey One of the chief objects of the power investigation is to determine the locations of possible power sites, indicate respectively their possible amounts, and to give such information publicity. In this way knowledge of the water-power possibilities of any one province may be communicated to other parts of Canada, and to other countries.

British Columbia has a number of streams which cross, and some of which re-cross, the International boundary, and, in connection with the utilization of these waters, there may be questions requiring consideration by the International Joint Commission. Some of these streams have large power potentialities.

In British Columbia the construction of railways in the lower portions of valleys debarb development of many of what would otherwise have been fine water-powers, and, in some instances, highways have been constructed in locations which also tend to prevent development.

Incidentally, the protection of great fisheries dependent upon inland waters arises in this connection. The instance which we

witnessed last summer of great numbers of salmon dying in the Fraser river, because of artificial blocking through railway blasting, has shown how carefully matters must be considered which may possibly affect the ingress and egress of valuable fish.

Report on Water-powers The officers of the Commission are now engaged in preparing the assembled data for publication.

This report will also include references to the law of the Province relating to waters, to various procedures under the law, and other cognate matters. The water legislation of British Columbia is quite advanced and has attracted international attention.

The volume which will be issued during the present year will deal with the water-powers of British Columbia from the line of the Grand Trunk Pacific railway to the International boundary.

FISHERIES, GAME AND FUR-BEARING ANIMALS

A report entitled *Fur Farming in Canada* was prepared early in 1913, for the Commission by Mr. J. Walter Jones. It deals with the various species of fur-bearing animals in Canada, but special attention is given to the fox-farming industry in Prince Edward Island. It is the first book of its kind ever published in Canada and the demand for it has been so great that the supply is exhausted. It has been sent to many parts of Canada and the United States and the requests that are still coming in, suggest the advisability of publishing a revised and enlarged edition bringing the report in line with the more recent developments of the industry.

Growth of Fur-farming Industry Phenomenal activity took place in the industry in 1913, especially on Prince Edward Island. Down to the present year, there were no statistics available and many conjectures as to the number of ranches and foxes thereon were quite wide of the mark. But, at the last session of the Prince Edward Island legislature, provision was made for imposing a tax of one per cent upon the value of the young foxes born from year to year, such tax to be in lieu of the tax on income derived from this source. Under the provisions of this Act, an enumeration was made in August last of all the fox ranches and the foxes in captivity on the Island, together with a sworn valuation of the young foxes reared this year.

As a result of this census, it was found that there are 233 fox ranches, of which 101 are owned by incorporated companies and 132 by individuals or partnerships. In these ranches, 2,480 foxes of all grades are in captivity, of which 1,325 are classed as silver-black. The sworn valuation of the young foxes this year was slightly over

\$3,700,000 from which the Provincial Government derives an income of \$37,000.

Figures revised to November 15, 1913, show the number and capitalization of fox-farming companies to be as follows :

CAPITALIZATION OF FOX FARMING COMPANIES

Province	Number of Companies	Capitalization
Prince Edward Island.	116	\$11,956,000
New Brunswick.....	19	1,810,000
Nova Scotia.....	30	1,445,000
Quebec.....	3	
Alberta.....	2	825,000
British Columbia.....	1	250,000
Totals.....	171	\$16,286,000

Future of Fur-farming

The development of the fur-farming industry in Canada has been remarkable and I am convinced that it is only in its infancy. The greatest danger which menaced the industry, viz., inflation and speculative over-capitalization, will probably be averted by the financial conditions which obtain at the present time. It is to be hoped that such will be the case. As a legitimate industry, it is profitable in the extreme and capable of very great expansion and variation. While all persons who engage in this industry cannot expect to reap the enormous profits which some of our fellow-citizens in Prince Edward Island have realized, it remains an undoubted fact, that the supply of fur taken from animals in a state of nature is constantly diminishing and that there is a continuing and never-failing market in the world, at high prices, for high grade furs. These furs can only be produced under certain climatic conditions. It is nature that clothes the animal with the valuable coat of fur suited to its environment. This environment is found in the natural conditions of Canada. To reap the profits of our geographical and climatic advantages, all that is necessary is to exercise the same care and judgment that would be requisite in any other line of production.

Research Work on Oyster Culture

A report on *The Canadian Oyster, Its Development, Environment and Culture*, embodying the results of investigations carried on over a number of years, has been prepared for the Commission by Dr. Joseph Stafford of McGill University. The first part of the work is of a technical character, dealing with the biological aspects of the oyster's de-

velopment ; while the second indicates some practical applications of this scientific knowledge.

The crucial period in the development of the oyster is at the time when the larvæ are ready to settle down on "cultch" and begin their settled existence. Unless this is determined with some accuracy, it is impossible for the farmer to plant fresh cultch at the proper time, and, as a result, large numbers of oysters are lost. This has hitherto been a matter of guesswork, but Dr. Stafford now believes that this period can be gauged with reasonable certainty and preparations made by the oyster farmer accordingly.

**Atlantic Oysters
in Pacific**

Another discovery of practical importance and interest, especially to British Columbia, is that Atlantic oysters can be bred successfully in waters of that Province. Formerly, it has been assumed that such was not the case.

As above stated, the report is, on the whole, of a highly technical character, and, in that respect, differs from our other publications. It has been the aim of the Commission to refrain from publishing anything except what contains practical information in the most condensed form and in popular language. In this case, however, the nature of the subject and the highly important character of the studies carried on by Dr. Stafford, as well as the results which have been achieved, made it desirable and, in fact, imperative, that we should print the work in full in its scientific form, in order that there might be available in the future for every student of the subject, a record of the work which has been done. It is the intention to publish another report which shall contain a summary, free from technicalities, of the information which has been gained and the conclusions reached.

Upon this subject of oyster culture it is gratifying to be able to record the fact that, following the publication of our first enquiry into the condition of the industry, an increasing amount of public attention has been directed to the subject with most beneficial results. Particularly in Prince Edward Island, this subject has received attention and I am informed that a general line of policy has been adopted which promises not only to revive the great oyster industry of that Province, but to develop it very far beyond the highest point which it reached in former years. Our friends in Prince Edward Island will probably be able before long to show to the rest of the Dominion that a small province, largely removed from possibilities of commercial development which are open to other parts of the Dominion, is yet able by a study of its natural

conditions and the development of hitherto neglected lines of production to attain an enviable degree of general prosperity.

WORK OF THE COMMITTEE ON MINERALS

There is now in press a report on the *Conservation of Coal in Canada*. This report catalogues briefly the methods followed in operating the principal coal mines of Canada. Emphasis is laid on the advantages of the leasehold system of granting coal areas which is in vogue in Nova Scotia, and the adoption of a similar system is recommended in other Provinces, more especially in Alberta, with a view to stopping the wasteful methods of mining coal which obtain in certain districts.

**Briquetting
of Coal** Attention is also directed to the advantage of
briquetting coal, in order to prevent the waste of
slack ; and the advantages of the by-product coke
oven over the type generally in use are set forth.

The fact that the practice of briquetting coal has not yet been followed on any considerable scale in Canada, is an illustration of the difficulty of securing the introduction of well-proved, economic methods which have been in use in older countries for many years. It is hoped that a beneficial change in this respect will come about in a short time.

In addition to visiting the different mining plants for the purpose of getting information upon which the report respecting the conservation of coal is based, our mining engineer acted as guide in connection with the visits of the International Geological Congress to the coal mines of Western Canada, and had the benefit of hearing the opinions of foreign scientists in regard to the conduct of the coal-mining industry.

While speaking of the work of the Committee on Minerals, I desire to refer with pleasure to the fact that there has been added to the personnel of the Commission a gentleman who will be well qualified to advise our Committee in connection with its future work. I have no doubt that the advice of Dr. Frank D. Adams, Dean of the Faculty of Applied Science, McGill University, will lend a scope and authority to the work of the Commission in the mining branch which will be of a most desirable character, and I am sure that I voice the sentiments of the other members of the Commission when I extend to him a most hearty welcome to the first meeting which he has attended.

WORK OF THE COMMITTEE ON LANDS

**Agricultural
Survey**

During the summer of 1913, the Committee on Lands conducted, under the direction of our colleague, Dr. Robertson, an agricultural survey in twenty-nine (29) districts in Canada. The work was similar to that done in 1911 and 1912, but was carried on in districts hitherto unvisited by the Commission. The survey included an investigation of crop rotations, crop areas, manures, weed and insect pests, fuel, power and water supplies, home conveniences, stock and grain kept and sold, and branches of farming specialized in. In order to obtain more uniform results, only seven men were employed to do the work during the summer months of the year. The figures and information obtained by means of the survey have been tabulated in the office ready for presentation at this meeting. General summaries of the agricultural conditions obtaining in the districts surveyed have been sent in by the men conducting the work and contain much valuable information and many recommendations.

Illustration Farms

The three travelling instructors of the Commission have been directing operations on thirty illustration farms, which were established during 1912. The instructors have paid about 250 visits in all to the various farms for the purpose of conferring with the farmers and giving them assistance and encouragement in the use of such means and methods as will improve the quality and quantity of the products of the farm, while maintaining or increasing the fertility of the soil.

Early in 1913, an instructor was appointed who now has charge of the instruction work on the farms in Manitoba, Saskatchewan, Alberta and British Columbia. The farmers formed themselves into local improvement associations and a number of meetings were held on the illustration farms in the East, at which the agriculturist and an instructor were present to discuss the work being done and to encourage the neighbouring farmers to practise the improved methods. Excellent reports have been received from many farmers showing distinct gains from better tillage, the selection and sowing of better varieties of seed grain, the utilization of farm-yard manure and the sowing of an ample supply of clover seed per acre. The farmers in the districts where the illustration farms are situated have repeatedly asked for winter meetings, and, in order to meet these requests, a set of slides has been prepared and arrangements are being completed to give a series of illustrated addresses on the production, care, and uses of manure; soil cultivation; clover growing; and the use of machinery on the farm.

During the year, numerous requests have come in for the instructors to address farmers' clubs, and agricultural societies and wherever possible, without interfering with the regular work of the Committee, speakers have been sent out.

THE PROBLEMS OF PUBLIC HEALTH

Work of Medical Adviser

The Medical Adviser of the Commission has, during the past year, delivered a considerable number of addresses to Canadian Clubs, Boards of Trade and school teachers, upon questions of Public Health, thus carrying out the purpose for which the Committee on Public Health was instituted, in stimulating and informing public opinion upon this important subject.

Dr. Hodgetts has also represented the Commission at important gatherings abroad, amongst others the English-speaking Congress on Infant Mortality and the Hygienic Section of the International Congress of Medicine, both held in London in the month of August, 1913.

He also attended the National City Planning Conference held in Chicago and the first City-planning Congress of the Commonwealth of Massachusetts on the same subject which was lately held in the city of Boston. Reports on these subjects have been filed by him for the information of the Commission.

The Medical Adviser also attended the sittings of the International Joint Commission held in the cities of Buffalo, Washington and Detroit, where evidence was presented in regard to the institution of a sanitary survey of international waterways. An examination was also made of the Detroit river in the vicinity of Amherstburg, and a study made of the plans of the proposed dam in the Detroit river opposite that town, for the purpose of giving evidence before the International Joint Commission, in regard to the pollution of the town's water-supply and of the waters on the Canadian side of the river.

Publications on Public Health

Several useful publications have been prepared under the direction of the Medical Adviser as follows: A compilation of the public health laws of the Dominion as suggested at the Conference of Health Officers in 1912. This work was urgently required and is very much in demand. A report has also been compiled for the Select Special Committee of the House of Commons having under consideration two bills regarding the prevention of the pollution of waterways. An illustrated pamphlet having reference to the collection and disposal of garbage in cities and towns, has been prepared and

printed in both English and French and 163,500 copies distributed.

The question of sewage disposal as practised in England and Germany has been carefully studied by the Medical Adviser and a report thereon is now in preparation, as well as a special report for the Select Committee of the House of Commons which has under consideration the question of the pollution of waterways.

**Housing and
Town Planning**

Perhaps the most important development in connection with the subject of Public Health has been the determination of the Commission to take up more actively the question of Housing and Town Planning. It will be remembered that some attention was given to this subject in the early stages of the Commission's work, and public addresses were delivered with the object of stimulating action by municipalities throughout the Dominion. Gratifying results have followed from this movement, a great deal of attention having been given to the subject in various places. The most practical work that has been done up to the present time has taken place in the city of Toronto, and, before the Commission closes its sittings, we shall have something on that subject from Mr. Frank Beer, a gentleman who is well qualified to speak on the subject.

**National City
Planning Con-
ference**

With the object of strengthening and advancing the movement in favour of more scientific town planning and more vigorous attention to the housing requirements of Canadians, the Commission have determined to act as the host of the National City Planning Conference which will be held in the city of Toronto next spring. Arrangements are now in progress for the holding of that Conference. It is intended, if possible, to make it the means of exciting more direct and effective attention to the subject throughout Canada ; and also to procure, if possible, a body of substantive legislation which will enable those who are desirous of promoting progress in this important department of social welfare to act under the sanction of law.

For this purpose there has been appointed a special Committee, of which Col. Jeffrey H. Burland is chairman. This Committee has for its duty the preparation of draft legislation. Col. Burland will present a report of the work of his Committee to you during our present meeting. It is the intention to have the recommendations of this Committee submitted to the several Governments of the Dominion, and, after receiving suggestions from them, to submit the whole matter to a Committee of the National City Planning Conference, with the object of getting a thoroughly digested measure.

When this has been done, an effort will be made to secure the enactment of the proposed legislation in the different provinces of Canada.

ADVANCE IN FORESTRY WORK

Conditions in Trent Watershed A report entitled *Trent Watershed Survey* by Dr. C. D. Howe and Mr. J. H. White of the Faculty of Forestry, University of Toronto, with an introductory discussion by Dr. B. E. Fernow, is now in press. The area investigated is one in which the conditions are typical of those prevailing over thousands of square miles of cut-over lands in the eastern provinces of Canada, and for which it is desirable to formulate a policy of reconstruction and recuperation. The Dominion Government has a special interest in this region, for the capital invested in the Trent Valley Canal system amounts to upward of \$10,000,000.

The report covers farming, forest, industrial, mining and tourist traffic conditions in the area considered. It shows that only 15,000 people inhabit the 2,100 square miles of the watershed (a decrease since 1901 of 15 per cent) and that hardly 10 per cent of the region has been cleared for farm purposes. The soil is altogether unsuitable for agriculture and run-down and abandoned farms are to be found in large numbers. One hundred and ninety-four farms were for sale for unpaid taxes in 1911 at six cents per acre.

Practically all the pine has been removed, and the whole area has been burned over at least once. Almost one-half the area is covered with young and second-growth trees of the poplar-birch type. As a result of fires, 150,000 acres are practically a desert.

It was found, however, that enough hardwood and wood of the poplar-birch type remain to warrant the adoption of a policy of conservation, and Dominion, Provincial or Municipal ownership of the territory in question, is suggested as an initial step in that direction. Other recommendations are: (1) The re-acquirement by the Province of the licensed lands which have practically ceased to produce the quantity of logs contemplated under original licenses; (2) The imposing of restrictions on existing limit holders, tending to protect the forest growth; (3) The appointment of a forester charged with the surveillance of the region; (4) The perfecting of a fire-protection organization, building of look-out stations and watch-towers; and, (5) The appointment of the game-wardens as fire-wardens.

**Protecting Forests
from Fire**

Since forest protection is the first essential to the development of forestry practice, and, since fire has always been the chief enemy of the forest, with the railways as one of the principal agencies responsible for destruction, it is proper to emphasize the remarkable improvement which has taken place in the railway-fire situation during the past year. The Commission of Conservation was instrumental in securing legislation which empowered the Board of Railway Commissioners to make regulations for fire protection along the railway lines. Under date of May 22, 1912, the Board, by Order No. 16570, covered the railway-fire situation very fully, and placed upon the railway companies subject to the jurisdiction of the Board, the responsibility for taking all measures necessary to the prevention and control of fires due to railway operation. As was reported at the annual meeting held last January, the Chief Forester for this Commission was also appointed Chief Fire Inspector for the Board of Railway Commissioners.

**Co-operation in
Fire-protection
Work**

During 1912, the railway-fire protection work was organized only in Western Canada. In 1913, the organization was, as far as possible, extended to Eastern Canada. The plan has been consistently followed throughout, of building up an inspection staff through co-operation with the existing fire-protective organizations of the Dominion and Provincial Governments, within the territory already covered by the jurisdiction and organization of each. Thus, the Railway Commission has appointed as officers of the Fire Inspection Department, a very considerable number of the officials of the Dominion Forestry Branch, Dominion Parks Branch, British Columbia Forest Branch, Department of Lands, Forests and Mines of Ontario, Forest Protection Branch of Quebec, and Crown Lands Department of New Brunswick. The principal work of these officials for the Board has been in connection with enforcing the requirements as to the patrol work and right-of-way clearing by the railways, though there has been a considerable amount of inspection of fire-protective appliances on locomotives, in co-operation with the operating department of the Board. It will be seen that, in this way, the work of fire protection undertaken by the Board, operates in complete accord with the existing fire-protective organizations of the Dominion and Provincial Governments, and all unnecessary duplication is avoided.

In Nova Scotia, the proposed plan of co-operation has not yet been put into effect, pending the appointment of a Provincial Forester, who, according to the law enacted last spring, following



EFFECT OF FOREST FIRES IN SOUTHERN BRITISH COLUMBIA

All such non-agricultural mountain lands should be protected from fire and devoted to the production of timber.

the report by Dr. Fernow, will handle forestry work for the Provincial Government, as well as supervise the work of fire-protection in general. It is to be hoped that the appointment of this official will not be long delayed.

To handle fire-guard inspection in the Prairie Provinces, plans of co-operation have been developed, whereby the Chief Fire Guardian of Alberta and the Fire Commissioner of Saskatchewan have been appointed officers of the Board. As to Manitoba, negotiations are now under way, which it is hoped will result in a similar arrangement for co-operation by the Fire Commissioner of that Province.

The results which have been secured as a result of the co-operative handling of the railway-fire-protection work have been admirable. The occurrence and spread of railway fires have been greatly reduced. The efficiency of the work is in direct ratio to the sufficiency and efficiency of the inspection staff made available by the various co-operating agencies. In Western Canada, practically no criticism could be made on this score. The Eastern Provinces are somewhat more conservative, and the completion of the organization comes more slowly. However, assurances have already been received, which will mean a very much more satisfactory organization in the East during 1914, and, as the work justifies itself by its results, further extensions may confidently be expected. For the most part, the railways have shown a decided appreciation of the work, and have endeavoured to comply honestly with the various requirements. There is every reason to believe that, henceforth the railways will be found among the minor—instead of the major—agencies responsible for damage by forest fires.

Organization In order to bring this prediction fully into effect,
Incomplete further action is necessary respecting two classes of railways not under the jurisdiction of the Railway Commission. These are the various provincially chartered railways, and the government railways.

As to the first class, action in the form of new legislation is needed in the provinces of Nova Scotia, New Brunswick and Alberta, that railways chartered by their governments may be required to observe the same precautions that are now required of Dominion chartered lines. These matters have already been taken up with the governments concerned. In Ontario, existing legislation may possibly be adequate, but there does not seem to be sufficient provision for enforcement.

The situation as to fire protection along the government railways has shown marked improvement during the past year. Following representations made last spring by this Commission and by the

government of New Brunswick, a system of special fire patrols was established along the National Transcontinental railway between Moncton and Edmundston, N.B., and special instructions were also issued to all employees in regard to reporting and extinguishing fires along the railway line. Much, however, still remains to be done before the system of fire-protection on government railways will be as intensive as that now required on lines subject to the Railway Commission. Along both the Transcontinental and Intercolonial, there is very much to be done in the way of removing inflammable matter from the rights-of-way. This situation is especially serious on the Transcontinental, and will mean a very serious fire risk until the *débris* is destroyed. It is also necessary that provision be made for special patrols on both lines through forest sections, and that all employees receive special instructions similar to those issued on the New Brunswick division of the National Transcontinental. Reports also indicate that a closer degree of inspection of fire-protective appliances on locomotives is needed, especially as to those running on portions of the Transcontinental not yet regularly opened for traffic. These various matters have for some time been the subject of discussion between our officers and the Department of Railways and Canals.

The suggestion has been made to the Minister of Railways and Canals that all of the government railways should be made subject to the regulations issued by the Board of Railway Commissioners. There can be no doubt that uniform regulations and a uniform inspection would be in the highest degree desirable and would conduce to effective fire protection. The suggestion is at present under the consideration of the Minister.

Investigations of Forest Resources

Material progress has been made in the collection of information regarding the forest resources and forest conditions of the Dominion. This work has been carried on during a portion of the year in two provinces. In British Columbia, Dr. H. N. Whitford is collecting information in relation to the territory south of the Railway Belt. In this work, the information secured through co-operative arrangements made with the Provincial Forest Branch and the Canadian Pacific railway, has been of the greatest possible value. A very large amount of information has also been secured from limit-holders and others.

In Saskatchewan, Mr. J. C. Blumer has been engaged in a similar study of the district west of Prince Albert. Here, the co-operation of the Forestry Branch of the Department of the Interior has proved exceedingly valuable. This information, as in British Columbia, is supplemented by data secured from limit-

holders and all other available sources. It is hoped that provision can be made to continue this work until the two provinces shall have been covered, and then to carry on similar work in other provinces until we shall have completed a comprehensive study of the forest resources of the Dominion.

**Forestry on
Dominion Timber
Berths**

During the past summer, attention has been given to forest conditions on the public domain in Alberta, Saskatchewan and Manitoba, and the Railway Belt of British Columbia. In this work, particular attention was paid to the matter of fire prevention through brush disposal, and to the question of securing a natural reproduction of the forest through control of the methods of cutting. In addition to certain technical features, the question of organization is involved, owing to the fact that jurisdiction of the timber lands of the Dominion Government is divided amongst three separate branches of the Department of the Interior. As to the timber berths, responsibility rests upon the Timber and Grazing Branch, which is to a large extent in practice, a fiscal organization, charged with such work as the collection of revenues, the prevention of trespass and the administration of grazing leases. The question of brush disposal as a fire-preventive measure, and of so controlling the methods of cutting as to ensure the perpetuation of the forest, are the principal technical features of present-day forestry practice. Provision for these matters is made in the licenses covering all timber berths, but, unfortunately, none of the branches of the Departments having to do with forests has at work a sufficient staff of trained men to enforce these provisions. The Crown timber agents and their office staffs are obviously unable to devote any personal attention to these matters in the field. The Inspectors under the Crown timber agents are the only men upon whom this work can fall under the present plan of organization. Of these, there is one at New Westminster, one at Kamloops, one at Calgary, six at Edmonton, four at Prince Albert, and five at Winnipeg. Their time is fully occupied with the duties regularly incident to their positions, and it is hopeless to expect that anything like adequate results can be accomplished by trying to impose upon these already fully occupied men the responsibility for the enforcement of the technical forestry provisions of the licenses. These provisions have not been enforced in the past on the licensed timber berths, nor can they by any possibility be enforced without the appointment of skilled officers especially charged with this duty. Thus, we have the anomalous situation of a lack of technical supervision of logging operations upon lands containing the greater

quantity of the accessible merchantable timber which is now the property of the Dominion Government.

The particular way in which the remedy should be evolved is, of course, strictly a Departmental matter. The main consideration is that the results ought to be accomplished in some way.

The above remarks are not intended, and should not be considered, as an unfriendly criticism. The situation simply appears to be that no effective provision for the administration of forestry regulations upon the timber berths of the public domain has yet been made. As a result, the protection and perpetuation of the forest upon the best timbered areas, both within and outside the forest reserves and parks, is most seriously endangered.

While this is the case, it gives me pleasure to draw attention to the excellent work of the same Department in connection with other branches of forestry work, the care of reserves and the encouragement of tree planting. There is no reason to doubt that the officers of the Department of the Interior will make effective use of any powers bestowed upon them.

**Permanency of
Forest Service**

Following the last annual meeting, representations were made to the Dominion and Provincial governments favouring the extension of the merit system of appointment in forestry and fire-protection work. I regret to say that, as yet, very little has been done toward carrying out the recommendations made. With regard to this measure, it is essential that the Commission should not cease to reiterate its views. Whatever may be said of other branches of the service, it is an unquestionable fact, that not even a moderate degree of efficiency and economy can be obtained in forest service, without a permanent and specially trained staff.

It frequently happens that men appointed in the ordinary political method from business life make very good officers while they have to deal only with collection of revenue and with what has heretofore been considered the usual work of a Crown timber officer, but, as fire rangers and supervisors of forestry regulations, such men are, when first appointed, absolutely useless. They will learn if they devote themselves to the work and stay long enough in one position, but, at best, such a system is extravagant and inefficient.

At this stage of our work, the prime necessity is to get the Governments of the Dominion and the Provinces to place the forestry staffs upon a permanent basis providing for appointment and promotion only for merit and qualification through a Civil Service Commission.



CONSERVATIVE CUTTING IN NATIONAL FOREST IN MONTANA
Note the low stumps and the disposal of the brush.

PUBLICITY WORK OF THE COMMISSION

Bulletins The bulletin under the title *Conservation* which has hitherto been published for eight months in the year, has, during the year 1913, been issued monthly. Frequently, it has been enlarged to six or eight pages. The number of copies distributed has been increased from 2,500 to 6,000. The cordiality with which these bulletins are received and the frequency with which they are utilized is an encouraging indication that the principles of conservation are receiving intelligent attention from the press.

GENERAL PROGRESS OF THE WORK OF THE COMMISSION

With respect to the general work of the Commission which has now been in active operation for four years, I feel that I can extend to you some words of congratulation. Upon practically every one of the subjects to which we have devoted attention, public interest has been aroused and in many cases most far-reaching and efficient work has been accomplished.

Functions of the Commission It cannot be too often repeated that it is not the duty of this Commission to act in an executive capacity or to exercise the functions of any Department of government, Provincial or Dominion. Our duty is to investigate, enquire, advise and inform. While in so doing, it will occasionally become necessary for us to do things which might be regarded as possibly falling within the function of a governmental department, we should never carry this work to a greater length than is necessary to arouse interest in it, to point a way to improvement and, in some cases, to collect the information necessary to the formation of intelligent judgment. While in each particular case that arises, there must be an exercise of judgment on our part, the above are the general lines upon which we must act.

It is gratifying to know that, as the result of adhering closely to these rules, we have been enabled to proceed with important studies and investigations, to take steps for the protection of the public interests, sometimes in antagonism to important interests and influences, and yet we have not, so far as I am able to discern, aroused antagonism in any considerable section of the community. On the contrary, our work is encouraged and assisted almost universally by the various public bodies and representative institutions throughout Canada.

**Efficiency of
the Human Unit**

With respect to the general progress of conservation ideas, it must be remembered that, in the last resort, the highest degree of conservation depends upon the efficiency of the human unit. In the course of the last twenty-five years Canada has expanded with very great rapidity. All kinds of development works have been entered upon with zeal and energy and with all the knowledge that was available to those charged with the duty of carrying on these works, but, it is a very well-known fact amongst those classes of men who have been called upon to direct the organization of important enterprises in the way of development, that the greatest lack in Canada, so far as this phase of its progress is concerned, is that of a sufficient number of skilled men available for employment in connection with such works.

There is hardly a single large commercial institution which has had to do with works of development which has not suffered serious losses by reason of the difficulty of procuring properly qualified help. The greatest need of Canada to-day from the standpoint of its material development is a higher degree of agricultural and technical education. That we have not excelled in this respect in the past, except in certain branches, has been due to the fact that attention has not been directed to these subjects for a sufficiently great length of time, to permit of the development of bodies of trained experts. In those branches of work where there has been sufficient time and opportunity as well as incentive, as, for instance, in connection with the dairying industry, Canadians have taken a rank equal to any in the world. In other branches of agricultural science our position is rapidly improving. The action of the Federal Government in providing a large fund for the extension of instruction in agriculture and the administration of the fund under so competent an adviser as Mr. C. C. James, must have a very great and beneficial effect.

The Commission on Technical Education after a thorough study of the subject has now made its report, and action thereon will be looked for with interest. It is most sincerely to be hoped that a plan at once simple, comprehensive and effective will be speedily devised for putting this important work on a satisfactory basis.

Before I conclude, I think it is my duty to make a short reference to the fact that, since the last annual meeting, we have suffered a loss in the death of one of our members, Mr. Frank Davison of Nova Scotia. Mr. Davison was a regular attendant at our meetings, very faithful in the work he was called upon to do in connection with the operations of this Commission. I am sure we all had with him

the most pleasant and satisfactory relations and we all regret very much that he has been removed from his sphere of usefulness by death. A resolution will be moved before we adjourn setting forth our regret in connection with that occurrence.

I shall now call upon Dr. Hodgetts for a few remarks upon the work of the Committee on Public Health.

REPORT OF THE COMMITTEE ON PUBLIC HEALTH

DR. HODGETTS said :

On behalf of the Chairman and Members of the Committee on Public Health, I beg to present the following report of the work done during the year 1913.

POLLUTION OF INTERNATIONAL WATERWAYS

During the early part of the year 1913, the very important question of the increasing pollution of our international waterways was under consideration by your Committee. The Medical Adviser conferred with the representatives of the Province of Ontario, and the sanitary expert of the United States section of the International Joint Commission, and assisted in formulating the scheme for the survey of the waters of the Great lakes with respect to pollution, which has been carried on during the past summer under the supervision of the International Joint Commission.

In the matter of the application of the Federal authorities of the United States to construct a dam at a point in the Detroit river opposite the town of Amherstburg, Ont., an examination of the river was made by the Medical Adviser in association with Mr. Arthur White. Subsequently, at a hearing held before the International Joint Commission, the former officer appeared and gave evidence, that, in his opinion, the construction of the dam at the point indicated in the application, would be a further menace to the water supply of the town of Amherstburg, as it would divert towards the Canadian shore the waters of the river, which are grossly polluted by the sewage of the city of Detroit, Mich. Such a condition would make the waters of the river an even greater menace to the health of the people of Amherstburg than they are at present.

FEDERAL LEGISLATION ON POLLUTION OF WATERWAYS

The question of the prevention of the pollution of our waterways by raw sewage has advanced a stage further during the past year. The Senate of Canada in 1912, passed for the second time the Bill introduced by Senator Belcourt which was based upon the

draft provided by the Commission of Conservation, and Mr. Geo. H. Bradbury, Selkirk, introduced a Bill into the House of Commons along similar lines. After the first reading of this latter Bill, it was referred to a Select Special Committee of the House. This Committee held a series of hearings, at which a number of sanitary engineers and others gave evidence. Mr. James White, Assistant to the Chairman, furnished valuable data on behalf of the Commission, and gave convincing evidence on the subject of pollution of our waterways and the urgent necessity which existed for federal legislation to prevent the continuance of the same. Evidence from a sanitary standpoint, as to the necessity for legislation was dealt with by the adviser of this Committee.

Upon the request of the Select Committee mentioned above, the Medical Adviser of the Commission visited the more important sewage disposal works in Great Britain and in Germany, for the purpose of securing information for the Select Committee upon the methods at present in operation in Europe.

CANADIAN HOUSING LEGISLATION, 1913

The most important step forward, which, up to the present time has been made in Canada in the direction of better housing conditions, is the passing by the Legislatures of the provinces of Ontario and Quebec of Acts having for their object the assisting of municipal authorities in the construction of dwelling houses in urban districts.*

It is to be hoped that, in the interests of good housing in all of the cities and towns of Ontario and Quebec, the many advantages afforded by the Acts will be taken advantage of at an early date. Then, the stigma which now attaches to all of our cities and towns will be removed from this portion of the Dominion at least.

Inadequacy of the Acts

In many respects the Ontario Act is excellent and worthy of being placed upon the statute books of every province in the Dominion. It stimulates personal initiative, and provides for co-ordinated municipal assistance under the most advantageous conditions. Yet it does not go far enough, in that it does not apply to suburban districts or to rural municipalities, both of which must be considered in a comprehensive scheme for better homes. Further, what is of still greater importance, it does not provide that the Provincial authority which legislated shall supervise and administer the law. It is not sufficient that good legislation shall be placed upon the statute books of each province to be carried out here and there at the option of a Company, however well meaning such a Company may be. There must be in

*See Appendix III.

each province, a Governmental Authority which shall have adequate power to administer the housing and town-planning laws. In addition, all housing and town-planning proposals in any municipality should be submitted for the approval and revision of the expert officials of this Authority. In such intricate and important subjects as these, which concern not only the present but future generations, legislation, to be effectual, efficient and economical, must be safeguarded by intelligent administration. The work of the British Local Government Boards in this regard, is both interesting and instructive.

Enquiries have been made as to the operations of the Local Government Boards, not only in relation to the two features of municipal activity just referred to but in the many other branches of the Boards' work, and the results of this enquiry will be embodied in a report to the Committee.

CANADIAN TOWN-PLANNING LEGISLATION, 1913

In the important and difficult matter of town-planning the legislation passed by the Province of Alberta during 1913, is outstanding as the most advanced piece of legislation of its kind, to be found on the statute books of any of our provinces.* The act is modelled after the English Town-planning Act, but it has incorporated therein several clauses to meet the special conditions of the province.

Administration in Alberta

As the Province of Alberta already has a Minister of Municipal Affairs, naturally the administration of the Act comes within his purview. But owing to the many intricate questions involved in town-planning, it would appear necessary that provision be made in the Act for the establishment of a Branch in this Department charged with the duty of drafting regulations and the consideration of all plans, etc., for housing and town-planning, that are proposed in any municipality in the Province.

CONFERENCES ON CITY PLANNING AND HOUSING

It will be remembered that at the last annual meeting of the Commission, housing and city planning were discussed, and it was decided to ask for the services, temporarily, of Mr. F. Adams of the Housing and Town-planning Branch of the Local Government Board of Great Britain. A request was accordingly preferred by Premier Borden, on the lines suggested by the Commission, but, as the Local Government Board was unable to spare Mr. Adams, no further action was taken.

*This Act is given in full, in Appendix III.

In May, 1913, the Medical Adviser attended the Fifth National Conference on City Planning* in the city of Chicago. Delegates were also present from several Canadian municipalities.

Still another important conference was that of the English-speaking Conference on Infant Mortality, which was held in London, England, in August, 1913. Delegates from all English-speaking countries were in attendance. Your Medical Adviser represented the Commission at this conference, and had the honour of being a chairman of session. A report of this conference will be presented to you before this meeting adjours.

PROVINCIAL OVERSIGHT OF MUNICIPAL WORK

It is becoming more apparent every year that provincial legislation with respect to municipal affairs, fails to accomplish the best results, unless it receives organized and intelligent supervision by a central authority. There is in each province a municipal code, or a series of acts, which, to a certain extent, controls, or rather delimits the functions of municipal authorities. In some provinces the provincial governments have appointed controlling Boards which have a limited power in respect to the actions of municipal councils. It cannot be said, however, that there is in operation a single Provincial Department of Civics which is properly officered with experts competent to consider, and to pass intelligently upon any and every scheme or measure relating to urban municipalities.

Department of Municipal Affairs

While the Local Government Board of Great Britain, under the direct control of a cabinet minister, may not be as perfect in its constitution or administration as the more sanguine would wish, yet it is far ahead of any similar branch of provincial government work in this country. A study of its methods, therefore, affords a good object lesson, in what can be done in this country, by the creation in each province of a Branch or Department charged with supervision and control of everything relating to municipal affairs. Such a Branch or Department should include in its service, experts in engineering, town-planning, housing, sanitation, statistics, factory inspection, law and other matters which come under the head of civics and which might be covered by a provincial municipal code.

In this country, where towns are being created and built rapidly, it is important that the initial work should be done carefully, for

*For a brief *résumé* of the topics discussed by this Conference, see Appendix V.

it concerns not only the present but future generations. The example set by the Local Government Boards in Great Britain may be very wisely adopted in respect to the method of enquiry, where the amount involved in carrying out proposed works, is not met out of the current rates. Thus, if a loan is required, the Local Government Board, on receipt of a proper application from the municipal council, accompanied by a report and plans, hold an official public enquiry at which an expert of the Board presides. Due notice of the enquiry must be given, and it must be held at some suitable place within the municipality, that all interested parties may be heard. The expert in each case is one of the staff within whose province the proposed work falls. The findings of the expert are considered by the chief and others of the Branch who may be interested. The application then passes finally to the legal branch of the Board, and, provided the law officials approve of its legal aspects, then, and not until then, is the application granted.

**Citizens Safe-
guarded**

The Local Government Board does not initiate or recommend to a municipality any particular scheme of civic work or improvement. But, as we have seen, all municipal projects are passed upon by experts. If they are disapproved, it is possible for the municipal authorities to ascertain how they may be improved or amended to suit the requirements of the Local Government Board. Thus, the British ratepayers have a security which we in Canada do not, at present, possess. At the same time, the capitalists who make the loans to municipalities for civic work, have a greater sense of security in the scheme after it has been approved.

The whole problem of the better control and oversight of municipal improvements where loans are involved is worthy of serious consideration. Your Committee, therefore, would suggest that this Commission should make a further study of the subject and prepare recommendations for the consideration of the several Provincial Governments.

COMPILATION OF PUBLIC HEALTH LAWS

During the year a compilation of the laws of Canada, which relate to public health, was made. Legislation enacted by the Federal Government and by each of the several provinces was included. As the acts of several of the provinces were either under revision or were being amended or consolidated, it was not possible to make this compilation at an earlier date. The publication of these important laws in a form to permit of their ready comparison will fill the want expressed some time ago at the conference of Provincial

Health Officers, and it is hoped it may lead to the health laws of the different provinces being brought more in harmony the one with the other.

FIRST-AID IN MINES AND IN FACTORIES

It is the feeling of your Committee that the question of first-aid to the injured is of sufficient importance from a conservation standpoint, to warrant the making of a recommendation to the several provincial governments with respect thereto. The Coal Mines Acts of British Columbia and Alberta require that mine managers and underground officials in coal mines shall be holders of certificates of proficiency in first-aid work.

It would be a distinct advance if a similar regulation could be put in force in the other provinces, as well as in British Columbia and in Alberta. Of still greater benefit would be legislation requiring that all mine employees should be given instruction in this very important work.

Still further, similar legislation should be put in force with respect to factory owners, so that their employees could become certified "first-aiders." It is worthy of note that employees of the Canadian Pacific, the Grand Trunk and Intercolonial railways receive training in first-aid through the voluntary action of these three great systems.

THE PROBLEM OF REFUSE DISPOSAL

During the year, a small pamphlet for popular distribution was issued by your Committee, pointing out the unsatisfactory and unsanitary manner in which household refuse is collected and disposed of in many of our towns and cities, and the careless manner in which "town dumps" are managed by municipal authorities. As no less than 163,500 copies were distributed—151,500 in English and 12,000 in French—it is to be hoped that the attention of the people has been directed to this important question, and that, ere long, there will be found in all our Canadian cities and towns not only a systematic collection of refuse, but a destruction of the same in well equipped and up-to-date destructors.

RECOMMENDATIONS ON FEDERAL HEALTH SERVICE

As no action has, as yet, been taken by the Federal Government with respect to the recommendations made by the Dominion Public Health Conference of 1910, and subsequently approved by your Committee and the Commission in 1911, it is suggested that the same or similar recommendations be again presented to the Premier of Canada. If legislation could be secured to provide for the

co-ordination of public health work throughout the Dominion, your Committee is of the opinion that a valuable service will have been rendered the people of Canada.

MR. SIFTON: Gentlemen, I have now pleasure in introducing the first lady speaker we have had at any meeting of our Commission. I have pleasure in introducing to you Mrs. H. P. Plumptre, Recording Secretary of the National Council of Women of Canada.

The National Council of Women and Conservation

AN ADDRESS BY

MRS. H. P. PLUMPTRE

Recording Secretary of the National Council of Women of Canada

MR. CHAIRMAN, Ladies and Gentlemen : I am sure you will understand that I have come here not as a speaker but as one who desires to learn. I am representing the National Council of Women, which is a federated organization of thirty-one Local Councils, in as many of our largest cities. There are, too, sixteen affiliated societies of women, many of them having very large memberships. For example, I might mention the Daughters of the Empire, the Victorian Order (which indeed is the child of the National Council, for the National Council originated the work of the Victorian Order of Nurses), the Women's Institutes and a great many others which I need not detain you by mentioning. We have, in all, a membership in our Council and affiliated societies of about one hundred and fifty thousand women, so that we feel that we have a large backing in any work we undertake, and that what we learn we are able to disseminate amongst a very large number of people.

More than that, we, as a National Council, represent but one of twenty countries from which the International Council draws its membership. All the great countries of the world are represented on the International Council of Women.

Work of Local Councils

Our work is chiefly carried on in the Local Councils in the various cities. These are granted considerable freedom of action, but there are a few general regulations. Thus, no Local Council is allowed to approach any legislature without the permission of the National Council. We desire to save legislative bodies from being troubled by small requests or by requests for things which are not necessary at the time or

place at which they are presented, and so to that extent we place restrictions on the Local Councils. But otherwise they are perfectly free to act as they think best.

We do our work mainly through eighteen standing committees, the most recently formed of which is that on Conservation. It is for that reason that you were kind enough to invite me to be present to-day to represent the National Council of Women. We feel that, as we are just starting this work, we should like to follow the best possible lines. Believing as we do, that in this work co-operation is more desirable than competition, I have been commissioned to be with you here to-day to learn on what lines you are working, and, if possible, to carry back some ideas as to how best to mould the policy of this new committee which we have organized.

**Co-operation with
Commission** For a number of reasons we thought we might be able to co-operate with you in your work. First of all, I would say the aim that you have and the aim that we have are very much the same, namely, the general welfare of the public. Your Assistant to the Chairman, Mr. White, said recently, that practically every branch of human endeavour was included in the work of your Commission. From another point of view, ours is almost the same field. We have standing committees on almost all the things on which you have standing committees and a great many others besides. We are like a large commission of women dealing with the many interests which touch the lives of women.

**Public Health
Work of National
Council** We have, therefore, a large number of standing committees. For instance, we have a standing committee on public health, one of the most active and the oldest of all our committees. It is obvious that public health is a matter of national concern. It is also obvious that it concerns first of all and chiefly the women of the country, because it is on them that the stress of caring for the sick generally falls, and because it is they who find in their own homes the disabilities that are brought on them by such things as Dr. Hodgetts has just been speaking of to you. Again, you have heard Dr. Hodgetts' reference to town planning. We have been working along the very lines of which he has been speaking, through our standing committee on public health.

**Agriculture and
Women** Then in agriculture we believe that there is a large and unworked field for women. Many branches of agriculture are now being opened up for women's work. For example, in connection with fruit picking and packing there seems to be work in which women can be very

well occupied. I have heard Katharine Davis, the first woman Commissioner of Correction that the city of New York has ever had, whose appointment was made by Mayor Mitchel recently, say that, in the state school at Bedford, the girls who were under her supervision there, built pigsties and even silos. She said that climbing a ladder is not, as has been generally supposed, a matter of sex, and that the girls were perfectly well able to build these structures. The open air and the country life benefited them greatly, particularly those girls who were weak-minded. We hope that some day the homestead regulations will be widened in Canada so as to allow women to take up homesteads on a freer basis than is possible at present.

**Immigration
Problems**

The question of immigration has of late, perhaps, been given more time and thought by our National Council than any other theme, because we feel that, at the present time, it is at the root of many of our social problems. For instance, the difficulties in connection with public health and housing, are very largely due to the enormous influx of persons, some of whom are not accustomed to city life, and who, when transplanted from small villages and country districts in the older countries, find themselves absolutely incapable of using the facilities of city life, even if they had them. In this matter too, we are in the position of a person who has invited guests, and, when they arrive at her house, says to them: "I am very sorry that we have no room for you, but if you will pitch your tent on the lawn until I build a guest-room I shall be delighted to have you." We invite people to come to Canada, and then fail to make provision for homes for them. These, then, are some of our reasons for desiring to co-operate with your Commission. Our aims are very much the same as yours.

**Council a Com-
plement of Com-
mission**

On the other hand, there are certain dissimilarities between our point of view and yours. When I compared the list of your standing committees with ours, I noticed that, by a curious coincidence, all but two of the committees of the Commission deal with property and only two directly with life, while, in the National Council, it is exactly the opposite. We have only two committees which deal directly with property and all the rest are dealing more directly with life. It is on that account that, it seems to me, our Council might complement in some ways the work of your Commission, because we, as women, have the care of life in its various forms committed to us. To put the matter epigrammatically, while you are concerned mostly with houses, the Council considers homes.

The question of education is one which has been of considerable interest to the Council since its institution. We have been earnestly striving for the spread of technical education on lines that would fit children for the lives they are to live, rather than for some more or less visionary existence. Technical education must be of great value in fitting children for real life. The conservation of human life is the immediate duty of the women of this country, and it is for that reason that we have these committees touching human life in many ways. In the old days the housewife, of necessity, procured such commodities as milk, water, etc., for her own home. To-day, she relies on the city council or other outside agencies for such things. It is impossible at present for a woman to manage these affairs for her home because they are managed for her by the city council. For this reason, women feel that these civic matters are of extreme importance to them.

**Extension of
Publicity Work**

The National Council also believes that in its affiliated societies it might find channels for disseminating the knowledge which your Commission has acquired. I think your Chairman has said that this Commission does not exist merely to accumulate knowledge, but rather, having accumulated it, to disseminate it as widely as possible. We can reach many small groups of persons. For example, take such an organization as the Women's Institutes which spread right through Ontario, reaching many places where there is not room for a Local Council. Then, through our locally affiliated bodies of teachers we can reach a large *clientèle* to whom such knowledge as you have would be exceedingly valuable.

The reports which Mr. White was kind enough to send to me, I have found most interesting. I might explain that I tackled, first, the one on oysters, and came to the conclusion that oyster beds were one of the few beds women were not expected to make. Many of these reports I think would be of great use to our members. I did not know that there were such reports to be had, and I am sure there are many others interested in the subjects that I am interested in who do not know of them and who would be extremely glad to read and use them. The National Council could make use of these reports. May I give a personal instance. Next week I have to address a Women's Canadian Club in another city. The officials of that Club asked me what would be the subject of my address. I said that I was coming to this meeting, and that I would speak on conservation, and I would endeavour to give a message from this meeting. So, it seems to me that the speakers the Council sends out from time to time, might mention the work of this Commission

and bring the women in the smaller centres into touch with it. After all, it is in the smaller places, even more than in the cities, that there is need for the knowledge which this Commission acquires, and the National Council could be of material assistance in disseminating it there.

**Conditions in
Smaller Towns**

Not long ago I was in a small village in Ontario, one of the most beautiful in the Province. I was being driven around by one of the ladies who shewed me the various places of interest there. She said to me : "We have one of the most beautiful towns in Ontario, (as indeed they have); we have a very beautiful school property right on the lake. Unfortunately, a large, cold-storage building in connection with the fruit industry has been built, and a railway switch has been run down past both entrances of our school, spoiling the property, and making it dangerous for the children to enter or leave the building." She also shewed me a very beautiful church property, but unfortunately, as she said, the surrounding property was sold without conditions, and so a large factory district is growing up in the residential district behind the church, spoiling this old and valuable property, one of the ecclesiastical heirlooms of Canada. As she spoke, we had to drive carefully, because workmen were felling some most beautiful maple trees, bordering the road. I asked why that was being done, and she said she did not know and neither did anyone else. Would it be possible for this Commission to have leaflets distributed telling people what they can do in similar cases, or advising along what line they should work to secure legislation ? It seems to me that the law is like a sprinkler, which I heard described recently in a report of the fire conditions in a certain city. One man described a fire, at which there was a damage of \$16.00 by fire, and of \$16,000 by water, because the firemen did not know where to turn off the sprinkler. The law seems rather like a sprinkler. Many people do not know where to turn it on in the first place, nor afterwards where to turn it off. So that, if this Commission could inform people generally, as to what laws there are, if any, by which a village or small growing town might be prevented from thus selling its birth-right for the good of one generation only, it would be doing a great service to the women of the country. If small and cheap leaflets, bearing on such questions as town-planning, could be distributed broadcast throughout these rural and smaller urban centres, they would be exceedingly useful.

This seems to me to be another means by which the Council might be able to co-operate in the work the Commission is doing.

Our great difficulty is that we cannot do much which requires outlay. We just manage to pay our way and that is all we can do. I think all women's societies are hampered in the same way ; and for that reason we cannot do as much educational work as we would like. However, if we could help in disseminating any of your literature or have our speakers speak on subjects connected with the work of this Commission we should be very glad to do so.

I am very grateful to you, sir, for allowing me to speak to the Commission.

MR. SIFTON : We are, I am sure, very much indebted to Mrs. Plumptre for her interesting address, and to the National Council for sending her here to represent the Council at our meeting to-day. As I said when I was making my opening remarks, it is not the function of this Commission to act in an executive capacity, but rather to induce others who are charged with executive functions to adopt conservation principles. I think that we will agree that in inducing people to do things, the co-operation of the ladies is very important and the National Council of Women can give us most valuable assistance. I have been very much struck in going to different places to speak on the subject of conservation, and the different subjects we have to deal with, to find the intelligent way in which the ladies of the community have been following what we have been doing. As a matter of fact, while the men, as a rule, are willing to give us a pious blessing they are not posted in regard to details, but the ladies seem to have read the reports in the papers and seem to know pretty well what they are talking about. So that the evidence is very strong, that, with that very influential section of a community the conservation idea has taken a strong hold, and I think we can assure Mrs. Plumptre that we will give the different matters to which she has referred our very careful consideration and co-operation.

Mr. Clyde Leavitt, our Forester, will now address us on the work of the Committee on Forests, of the Commission.

REPORT OF THE COMMITTEE ON FORESTS

MR. LEAVITT : The report of the Committee on Forests for the year 1913 is, for the most part, one of progress.

At the instance, largely, of the Commission of Conservation, the Board of Railway Commissioners on May 22, 1912, issued its well-known order, No. 16570, with respect to forest fires along the

lines of railway that are subject to its jurisdiction. The unique feature of this order was that it placed on the railway companies under the jurisdiction of the Board, the responsibility of taking all the precautions reasonably necessary in order to prevent forest fires due to the railway operation. For the purpose of administering the order, and in pursuance of a co-operative arrangement between Hon. Mr. Sifton and the late Chief Commissioner Mabey, the Chief Forester of the Commission also holds the position of Chief Fire Inspector of the Board of Railway Commissioners. Thus, this Commission has every reason to take a particular interest in the railway fire-protection work, although the actual administration of the work itself is necessarily under the sole jurisdiction of the Railway Commission, to the members of which the fullest credit must be given for the splendid support they have afforded the new Department.

The report respecting railway fire protection work has already been covered by the chairman in his address and need not be here repeated. In general, the plan has been followed of co-operating with the Federal and the several provincial forestry officials. This has resulted in an economical as well as an efficient administration of the fire protection work.

INVESTIGATION OF FOREST RESOURCES

Considerable progress may also be reported in connection with matters other than railway fire protection. A beginning has been made toward the collection of information relative to the forest resources and forest conditions of the Dominion. The value and importance of this work may be realized when it is considered that there is at the present time no sufficient basis for anything like a reliable estimate of the forest resources of the Dominion as a whole. It is, however, known in a general way that these resources have been vastly over-estimated, and that, instead of being able to supply the United States, after her timber shall have been exhausted, Canada has, as a matter of fact, probably not more than one-fifth to one-fourth as much saw timber as has the United States.

Investigations in British Columbia

The work of collecting this information was commenced during 1913 in two provinces. In British Columbia, Dr. H. N. Whitford has gathered information relative to the territory south of the Railway Belt. In this work, the co-operation of the British Columbia Forest Branch and the Forestry Branch of the Canadian Pacific railway has been of the very greatest value. Limit holders have also been of very material assistance, by furnishing information as to the quantities of timber in various specific sections of the province. At the same

time, Mr. J. C. Blumer has been engaged in similar work in the district west of Prince Albert in Saskatchewan. Here the co-operation of the Forestry Branch of the Department of the Interior has been most helpful. As in British Columbia, the limit holders have provided much valuable information. It is considered exceedingly important that this work be continued until the two provinces have been covered. This is the first attempt at a comprehensive study of this kind in Canada, and the results will undoubtedly be of great interest and value.

INCREASED APPROPRIATION WILL BE REQUIRED

It now seems, however, that unless the existing appropriation can be increased, not only will it be impossible to extend this work so that the final result for the whole Dominion may be secured within a reasonable number of years, but, as it may even be necessary to cut down the amount of work now being done in British Columbia and Saskatchewan, the results in these two Provinces may be seriously delayed. It is believed that this work should be handled on such a scale that the data for British Columbia and Saskatchewan may be gathered within the next eighteen months, and for the whole Dominion within five years.

There are also various other investigations for which it is exceedingly important that provision be made. One of these is a study of forest reproduction and rate of growth, with a careful check estimate of the amount of standing timber on representative portions of the Crown timber lands of New Brunswick. There has already been tentative discussion with the government of New Brunswick relative to a co-operative handling of this project. It is believed that the execution of such work as this, not only in New Brunswick but in other provinces as well, together with the collection, on an adequate scale, of data relative to the forest resources of the Dominion, will amply justify a request for an increased appropriation for the work of the Commission.

A detailed statement of the financial situation as to forestry work during the current year, is as follows :

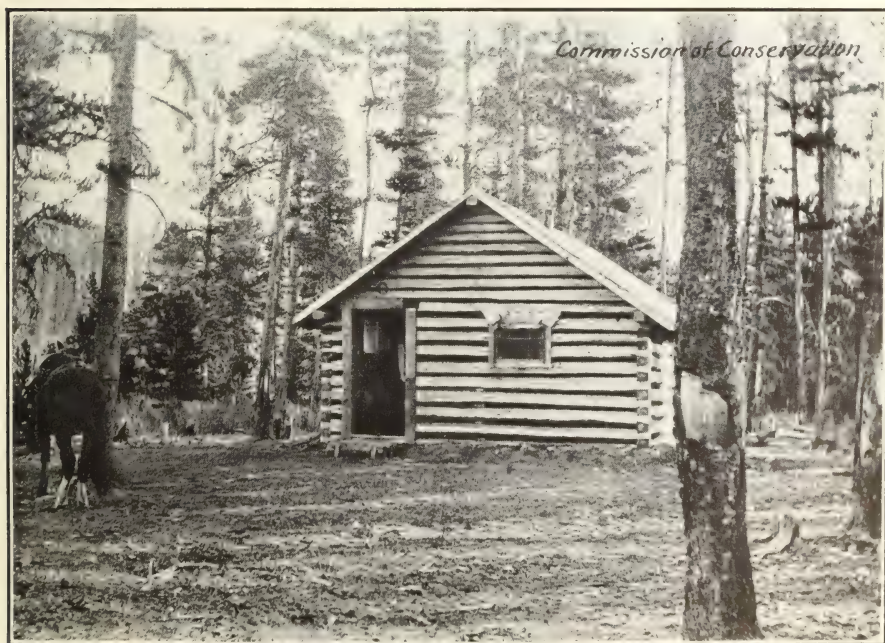
Cost of investigation of forestry conditions on public domain, by J. H. White, approximately.	\$1,700
Cost of detailed study of forest reproduction on Trent Watershed, by Dr. C. D. Howe, approximately.	1,600
Study of forest resources and forest conditions in Saskatchewan, by J. C. Blumer.	1,000
Study of forest resources and forest conditions in British Columbia, by Dr. H. N. Whitford, to date.	1,600
Necessary for balance of fiscal year.	1,100



WINTER FOREST RECONNAISSANCE WORK, NEAR SAVANNE, ONT.

This work was done by the C.P.R. in the effort to locate adequate local timber supplies for the use of the Company, in the district west of Fort William.

Note in the background the effect of forest fires.



RANGER STATION IN THE BRAZEAU FOREST, ALBERTA

Constructed by the Dominion Forestry Branch. Such stations enable forest rangers to reside in the vicinity of their work, and thus furnish much more efficient protection from fire.

The total approximate cost of conducting all the above field work, exclusive of travelling expenses of the Chief Forester, is thus approximately \$7,000. The projects of Messrs. White and Howe were conducted only during the summer, approximately four months. Messrs. Whitford and Blumer were not employed until late in the summer.

Dr. Whitford is still on duty, and the above estimate (\$2,700) covers a period of approximately seven months. The estimate for Mr. Blumer's work (\$1,000) covers approximately four months' work, and it is impossible to continue the project at the present time on account of lack of funds. Both these projects will require to be prosecuted during the whole of the coming year, and longer, unless the benefit of the work already done is to be largely sacrificed. In addition, provision should be made for one man to work with Dr. Whitford, in order that the report on the entire province of British Columbia may be completed within the next eighteen months. Provision should also be made for a detailed study of forest reproduction under various conditions, on burns and cut-over lands in British Columbia, to supplement the information relative to the stand of timber, etc., being collected by Dr. Whitford.

A detailed summary of the needs for the ensuing fiscal year is as follows :

ESTIMATE OF AMOUNT REQUIRED IN 1914-1915

For continuation of work of Dr. H. N. Whitford, study of forest resources of British Columbia.....	\$ 4,500.00
For additional man to co-operate with Dr. Whitford in British Columbia.....	4,500.00
For continuation of work of J. C. Blumer, study of resources of Saskatchewan.....	4,000.00
Study of forest reproduction in British Columbia....	2,000.00
Co-operative forest investigation in New Brunswick..	2,000.00
Total.....	\$17,000.00

The total needed is thus \$17,000, or \$10,000 additional to the sum made available during the present year. If the Commission desires to retain the services of Dr. Whitford and Mr. Blumer, continuous employment must be provided, otherwise new men must be found when the work can again be taken up, thus losing the benefit of personal experience gained by the men, and delaying the work so greatly that its value will be largely lost before the final results can be secured.

DOMINION FOREST RESERVES EXTENSION

The Forestry Branch of the Department of the Interior has had, each year for some years past, six or seven parties in the field examining the lands in the Western Provinces which are under Dominion

jurisdiction. The purpose of this work has been to determine the lands that control watersheds or are absolute forest lands and which should, therefore, be set apart for timber production. In addition to the area of 35,805 square miles already set apart for forest purposes by Act of Parliament, the surveys show that there is an additional area of 20,980 square miles which is best suited for timber growth.

**Character of
Areas**

These areas are of two characters. There are, first, the large forested watersheds in the northern portions of the provinces of Manitoba, Saskatchewan, and Alberta, such as the Porcupine hills, the Pasquia hills, the Swan hills and others. These form the main watershed between the Mackenzie and Churchill river-systems and the Saskatchewan and Red river-systems, and should, in addition to protecting the water supply, form the great source of timber for domestic and manufacturing purposes for the great prairie regions to the south.

The second class of reserves includes smaller or larger areas of light sandy lands scattered through the prairie which have absolutely no agricultural value, and which, although now generally denuded of tree growth may, by an active policy of reforestation, be made of great value to the surrounding prairies.

In the Railway Belt, in the province of British Columbia, there are also large tracts of mountainous country which are suitable only for forest lands and which, after examination, have been recommended for addition to forest reserves. The Commission of Conservation should use its influence to secure these additions to the forest reserves.

A detailed statement of the results of the Forestry Branch examinations is as follows :

**APPROXIMATE AREAS OF ADDITIONS TO THE DOMINION FOREST
RESERVES, RECOMMENDED BY THE FORESTRY BRANCH,
DEPARTMENT OF THE INTERIOR**

BRITISH COLUMBIA, RAILWAY BELT

NEW RESERVES

	Square miles
Shuswap Lake.....	1,097
Hope.....	1,044
Nahatlatch.....	935
Joss Mountain.....	802
Petee.....	747
Coast.....	1,200
	—5,825

ADDITIONS TO EXISTING RESERVES

Hat Creek.....	178
Larch.....	30
	— 208
Total for British Columbia.....	6033

ALBERTA		Square miles
Lac la Biche (new reserve).....	4,248	
Lesser Slave (addition).....	1,496	
Total for Alberta.....		5,744

SASKATCHEWAN

NEW RESERVES		
Dundurn.....	63	
Sheep Creek.....	7	
Stench Lake.....	27	
Keppel.....	25	
Steward.....	31	
Eagle Hills.....	34	
Good Spirit Lake.....	6	
Manitou Lake.....	180	
Sturgeon River.....	560	
Pasquia Hills.....	2,592	
Big River.....	1,250	
Battleford.....	951	
Elbow.....	115	
		5841
ADDITIONS TO EXISTING RESERVES		
Cypress Hills.....	26	
Porcupine.....	2,559	
		2,585
Total for Saskatchewan.....		8,426

MANITOBA

Lake Winnipeg (new reserve).....	546	
Eastern Manitoba (new reserve).....	231	
Total for Manitoba.....		777
Total for British Columbia (Railway Belt), Alberta, Saskatchewan and Manitoba.....		20,980

TRENT WATERSHED SURVEY

There is now in process of publication a report on the Trent Watershed Survey, by Dr. C. D. Howe and Mr. J. H. White. This report was prepared under the direction of Dr. B. E. Fernow, and shows very clearly the serious consequences which have followed the agricultural settlement of a section of Old Ontario, which, for the most part, is essentially non-agricultural in character. The thin soil having quickly become impoverished by cultivation, the people who remained on the poorer lands are living under undesirable economic conditions. The merchantable timber has been largely removed, and protection from fire on such lands has ceased to be worth the while to the limit-holders and has practically not been given. Neither has such protection been considered practicable or worth while on the part of the Provincial Government itself. The result is that the repeated fires have destroyed a young growth

of timber having a potential stumpage value of millions of dollars, besides impoverishing the soil, facilitating erosion, and so changing the composition of the forest that its possible future value is greatly decreased. This is a matter of serious import to the Dominion Government, since the area in question comprises a large portion of the watershed of the Trent canal, the partial construction of which has already involved the expenditure of something like ten millions of dollars.

**Value of Forest
Cover**

It is thoroughly established that a forest cover exercises a very beneficial influence in preventing extremes of low-water and high-water stages. The maintenance of a forest upon the slopes is, therefore, of the greatest importance, in order to supplement and protect the necessary system of dams for water storage. To this end, it is essential that an adequate system of fire protection be established. Even during the past summer, fires burned over not less than 190,000 acres, largely covered with young growth, causing an enormous present and prospective loss.

**Conference of
Governments
Suggested**

The interest and responsibility of the Provincial Government in this matter is great, since it still controls approximately one-third of the area in question. Probably the most practicable arrangement would be for the Provincial Government to take the initiative, the Dominion Government making a cash contribution to cover a portion of the cost of protection, in consideration of its very great interest in the matter. Co-operation on the part of the municipalities and private owners is also suggested in the report. It is believed that this matter is of sufficient importance to justify a conference between representatives of the Dominion and Provincial Governments, looking toward the adoption of a definite co-operative plan for the solution of the problem.

It should be understood that the situation on the Trent watershed is not an isolated case, but is merely one example of a situation which exists to an alarming extent in other portions of the Dominion.

EXTENSION OF POWERS OF CIVIL SERVICE COMMISSION

In accordance with recommendations made at the last annual meeting, representations were made to the Federal and to the several Provincial Governments urging the extension of the merit system of appointment for forestry and fire-protection work. So far as the Dominion Government is concerned, this matter is covered in a general way in the report of Sir George Murray, which is now under



VIRGIN FOREST IN BRITISH COLUMBIA

It is improbable that trees grown in forests in future will be allowed to reach the great size of those in many virgin forests. Such great size is neither necessary nor desirable for commercial uses.

consideration by the Dominion Government. The elimination of political influence in matters of personnel is believed to be absolutely essential before satisfactory results can be hoped for in fire-protective organizations. The extension of the jurisdiction of the Civil Service Commission to the field staff of the Dominion Forestry Branch, would go further in increasing the efficiency of the fire-protective work of that organization than perhaps any other step that could be taken. This matter should again be strongly urged upon the Dominion Government.

Brush Disposal The question of brush disposal as a fire preventive measure, and of so controlling the methods of cutting as to ensure the perpetuation of the forest, are the principal technical features of present-day forestry practice, and provision for these matters is made in the licenses covering all timber berths.

The chairman has referred to the study of forest conditions on the public domain in Manitoba, Saskatchewan and Alberta, made by Mr. J. H. White. It is expected that Mr. White's report will be published during the coming summer.

MR. SIFTON: We shall now have some remarks from our old friend, Dr. B. E. Fernow, on forestry work in the Trent Watershed and in British Columbia.

Forestry Work in the Trent Watershed and in British Columbia

BY

DR. B. E. FERNOW

Dean, Faculty of Forestry, University of Toronto

I SUPPOSE I have been asked to speak to you and to discuss certain aspects of the forestry work of the Commission, because I have been to some extent instrumental in having the Commission undertake such work as the survey of the Trent watershed and the stock-taking of forests in British Columbia.

I wish, at the outset, to congratulate the Commission on having commenced definite enquiries concerning forest conditions in Canada. I believe that a beginning has been made along the proper lines.

Nobody will deny that a reduction of damage from forest fires is of most immediate importance in all parts of the Dominion. In this regard, the greatest credit is due to our Chairman in particular, and to the Commission in general for the efficient manner in which this problem has been attacked at one of its most vulnerable points by securing the co-operation of the Railway Commission. I consider that that is without question altogether the best piece of *constructive* work that the Commission has so far accomplished. In one year, the whole problem of protection against fires set by railway locomotives has been vastly improved.

To secure an extension of the organization and co-operative procedure, such as Mr. Leavitt has outlined, should be, of course, the first concern of the Committee on Forests for the coming year.

While the fire danger along railways is already, to a large extent, minimized, that from logging operations needs still better supervision, especially as regards brush disposal. This will be a more difficult matter to control. The work of organizing the battle against the fire fiend is one that requires hardly any specific knowledge that has not already been acquired. It is a matter of arrangement with provincial and Dominion authorities—of conference and negotiation. All other movements to secure a stable forest policy require more specific and detailed knowledge of conditions. Such knowledge does not exist in tangible form and must be secured first by investigation.

If the Commission is to exercise its educational function it must first ascertain facts. The entire forestry problem hinges on the fact that our timber resources are not "inexhaustible," as they have been supposed to be. Indeed, the impression is gaining ground that they are very limited; that large areas are in an unproductive condition, partly due to incurable natural, partly, to curable human causes; that growth in our northern climate and thin soils, with the exception of portions of British Columbia, is slow; and that the natural reproduction does not promise to furnish an adequate supply of log timber for the future. If these arguments cannot be substantiated by facts, then there is no *raison d'être* for the existence of the Commission of Conservation, so far as forestry interests are concerned, for there would be no need of forest conservation. To confirm the statements underlying these arguments should then be the first business of the Commission in order to prepare a basis for constructive work.

**Suggested Lines
of Enquiry**

These arguments, upon which, I take it, the forest conservation idea is based, open up four lines of inquiry for the Commission to undertake, which are

fundamental to the proposition of government interest in forestry, namely :

1. Securing a knowledge of the available log timber supplies ;
2. Securing knowledge of the forest conditions from the standpoint of the chances of reproducing these supplies ;
3. Securing a knowledge of the character of the reproduction and rate of growth in our cut-over areas, to give an insight into what we may expect for the future, and in what direction to exercise our efforts ;
4. Ascertaining conditions on limited areas which have been misused, or are liable to misuse, as samples for guidance in framing the practical measures which may be taken in order to return them to usefulness.

The examination of the Clay Belt in New Ontario and the Trent Watershed survey belong to the last class of inquiries. The Nova Scotia report, which the Commission has printed, and the stock-taking in British Columbia and Saskatchewan are inquiries of the first class, and include also those of the second class. The third class—inquiries into rate of growth—has so far been given but little attention.

Regarding the problem of stock-taking, the desirability of it was recognized by the Commission at the very outset, but the proper means of doing it were not found. As a matter of fact, if an accurate acre by acre, or even square mile by square mile, cruising were attempted, the cost would be such as to swamp the treasury of the Dominion, and it would also take many years to complete it. There is no need of such detailed information, which would have justification only for commercial transactions. An insight into the situation in general, with sufficient detail to substantiate the insight, is all that is wanted.

Information already exists concerning almost every township and often every lot. But it requires to be collected and collated. Actual cruising have been made in many cases, the results of which can often be obtained from lumber companies, railroad companies, or other sources, and can be pieced together to cover much of the ground. Finally, it should be recognized that Nature works by types. Thus, if one is familiar with forest types and has a knowledge of the contents of some sample areas, and in addition, is familiar with the distribution of types, which in part conform to topography,

one can apply that knowledge, either to check statements or to make reasonable guesses for a wider field. In other words one may acquire the capacity for "wholesale seeing." To gather information in this miscellaneous manner, so that the resulting collation will be reasonably accurate is not so much a matter of method as of men capable of doing this class of work. Such men are not very easy to find, for they must combine in one person the qualities of the experienced fieldman, and the skilful investigator. In addition, they must have sufficient literary judgment to compile information with clearness and accuracy.

**Work of
Dr. Whitford**

The Commission has been lucky in finding such a man in Dr. Whitford, who in less than four months completed the survey and plotted in more or less detail the information gathered with respect to an area of 20,000 square miles, classifying the land into five classes, namely, agricultural land with timber and without merchantable timber, absolute forest land with timber and without merchantable timber, and non-productive land or waste.

Dr. Whitford writes that he is satisfied with the result of his labour, and, if *he* is, you may rest assured, it is satisfactory. At this rate, in less than two years, if properly assisted, we may know with sufficient accuracy the extent of timber supplies and the forest conditions of our leading forest province.

**Increased Approp-
riation Essential**

I note with some alarm an allusion in Mr. Leavitt's report to the effect that there is a possibility of interrupting this work for lack of appropriation. This would be most regrettable and, in my opinion, would also be short-sighted. For, in the first place, this is the most important work in forestry lines that the Commission has to undertake. In the second place, it may not be possible to find the man again who is specially fitted for carrying out this work, and it would be a serious loss to abandon it just as the men have acquired the local knowledge which fits them especially for the work. Thirdly, the co-operation of the British Columbia Government which assures rapid progress, should not be lightly abandoned; there is, in a way, a moral obligation to continue. Lastly, the partial information so far gathered has value only, or mainly, if the whole commercial forest area is canvassed, and this should be done as nearly as possible at the same time. It would, indeed, be a great mistake to allow work so well begun to be discontinued. It would be an admission that the Commission is not sure of its purpose in this regard.

At the present time there is sufficient forestry work for the Commission to undertake to justify the expenditure of \$25,000 a year for



FOREST PLANTATION IN NORFOLK COUNTY, ONT.

This work is being done by the Provincial Government. Such non-agricultural lands should be replanted and devoted permanently to forestry.



WINDFALL IN SPRUCE FOREST, FOLLOWING CUTTING TO TEN-INCH DIAMETER LIMIT
Diameter-limit cutting must be used with great care and judgment in order to avoid
injuring rather than benefiting the forest. Note the great fire hazard.

the next four years. Much of this work is urgently in need of attention. In that time, the Commission could lay the foundation upon which the Dominion and its provinces could build a rational forest policy, and further expenditure of funds could be considerably reduced.

**Trent Watershed
Survey**

I should like to refer briefly to the Trent Watershed survey. The principal features of the report thereon have been already given to you by Mr. Leavitt, as well as in my statements at the last annual meeting of the Commission, and perhaps in newspaper reports. I regret to say the latter have made one phase of the survey much more prominent than it is made in the report, namely, the condition of some of the settlers in the district. There is, however, no denying the fact, that quite a number of farmers within the territory surveyed whose farms are little else than rocks are in an unfortunate condition and should be assisted to improve their condition. I regret that the publication of the report has been so long delayed, as some of the statements made therein have been rendered inaccurate owing to the fires of last summer. These fires overran approximately 190,000 acres so that the classification of these areas in the report requires some alterations. At the same time they accentuated the need of a greater protection from forest fires in this watershed if the interests in the water supply of the canal and the water-powers developed on it are to be protected.

A detailed study of the white pine reproduction in the watershed was made by Dr. Howe, who also ascertained the extent of last summer's fires, and calculated that at a low estimate, they gave rise to a loss in prospective values of around \$3,000,000, while preceding fires on the 600,000 acres of pinery had cost some \$8,000,000 in prospective values.

**Fire Protection
Inadequate**

The province of Ontario still owns about 725 square miles, in the district, mostly in a compact area. Of this, some 450 square miles are still under license but will soon be abandoned, while the remainder of the licenses have lapsed. Since the merchantable timber is mostly cut, the interest of the Province in the cut-over lands does not seem to be strong. At all events, protection against fires appears to be inadequate. Of the sixteen separate fires, ten started on lands not patrolled by fire-rangers. Of the five fires which were responsible for the largest loss—85 per cent—three started on Crown lands without patrol, and two, where one ranger looks after about 100 square miles.

The interest of the Dominion in protecting the watershed is superior to that of the Province, and we hope that with the full

data of conditions before it, the Dominion Government may be induced to take up the problem of a co-operative method of reclaiming this valuable territory and conserving the water supplies of the Trent canal.

MR. SIFTON : Our friend, Dr. Fernow, is always interesting and always instructive. I think that there is no subject that is more important for us to deal with at this meeting than the questions which arise out of the discussion of this Trent watershed. Similar questions are arising now in connection with the new portions of Ontario and Quebec. We have been building railways through the newer sections of the country, and I am told that in neither the province of Ontario nor the province of Quebec has any method been devised for distinguishing, any careful method of separating the land supposed to be fitted for settlement and the lands which are not ; but that, when townships are surveyed, they are thrown open to settlement indiscriminately. That happened in connection with the Trent watershed to the injury of the country and the people who went on the land. They, and their descendants, have never been able to be prosperous or happy, and that they have degenerated as we have seen, is a matter to which we should pay attention. It lies with us to take a strong stand and to endeavour to secure the adoption of an intelligent policy, in regard to the settlement of the lands that are partially in forests in Ontario and in Quebec, especially along the lines of new railways. I hope that the Committee on Forests at this meeting will give special attention to this, so that we can have, at the proper time, leading members go to the government and endeavour to secure the adoption of an intelligent policy in that regard.

We shall now hear from Mr. R. H. Campbell, Director of Forestry for the Dominion.

Work of the Forestry Branch, Department of the Interior

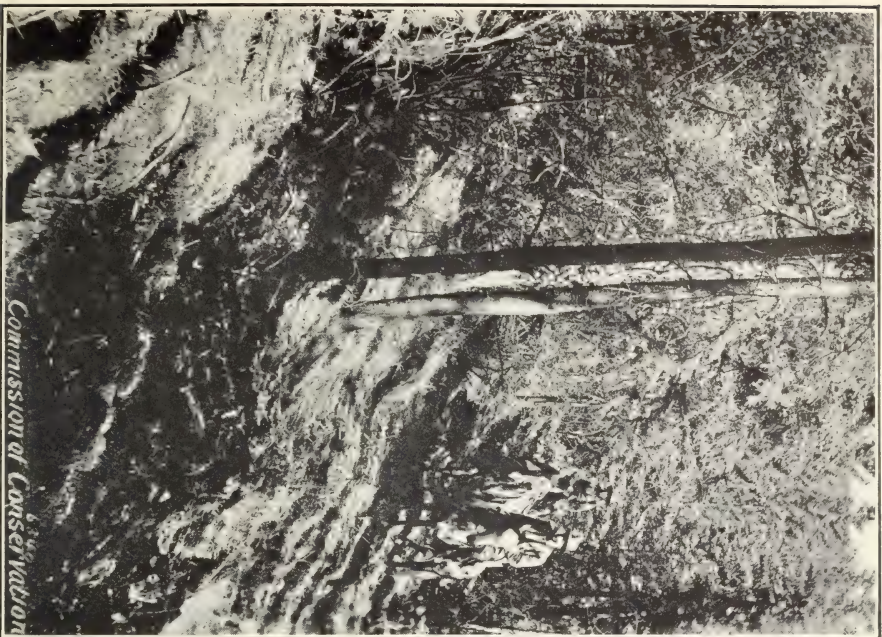
BY

R. H. CAMPBELL

Director of Forestry

AS I know that the time at your disposal is limited, I shall just refer, as briefly as possible, to a few points in connection with our work.

The Chairman, in his address, referred to the work that has been done by the Dominion Forestry Branch in tree planting on the prairie. That division of the work was commenced first, and it is



TRAIL, CONSTRUCTED BY DOMINION FORESTRY BRANCH, BOW
RIVER FOREST, ALBERTA
The construction of trails greatly facilitates communication and
thus assists materially in forest-fire protection.



UTILIZATION OF MERCHANTABLE TIMBER RESULTING FROM
CLEARING RAILWAY RIGHT-OF-WAY
Railway construction work, Crowsnest district, B. C.

one of the most important that we have undertaken because it means much in the making of comfortable and beautiful homes, and the betterment of conditions in general, on the prairie. I shall just mention the figures in regard to the distribution of trees that we have made in the Prairie Provinces. Last year, 1913, we distributed 3,613,600 trees, and since that work was begun, we have distributed 25,264,260 trees. The demand is increasing, so that we have had to enlarge our nursery area to a very considerable extent, in order to meet it. With the area of the nursery increased, we expect that we can double our output of nursery stock, so as to much more rapidly overtake the demand throughout the prairies.

**Forest
Reserves**

Another division of our work is the establishment and administration of the forest reserves. We have at the present time nearly 23,000,000 acres in forest reserves, and we are recommending, after examination, that there should be a further addition of nearly one-half that area. Reserves are established in order that the work in connection with the areas reserved may be put on a permanent basis. There is absolutely no possibility of our ever reaching an effective system of fire protection or an effective system of administration or management of timber unless we can get the work on a permanent basis. Tree-growth, as we all know, is very slow, and that fact in itself makes it clear, that, if a forest is to be properly administered, it must be done on a permanent basis, which means that there must be a permanent situation for it. Having established these reserves, we have gone on, in the first place, to try to get a protective system that would be effective, and that has involved making a good many improvements on them. In the first place, we had to have our rangers reside on the reserves so that they would be on the spot where the work was to be done, and where fires were likely to occur. For this purpose, we have already built some thirteen houses on the reserves and some thirty-three cabins, in order that our men may be kept on the reserves as closely as possible. This feature of the work will probably be extended.

**Roads in
Reserves**

In order to improve the communications throughout the reserves, we have constructed roads in many cases, so that any point may be reached without too much difficulty or great loss of time, particularly when fire occurs. In all, some one hundred and thirty-one miles of roads, and six hundred and eighty-four miles of trail were constructed during the past year. In this way we are opening up the reserves, so that when fires occur the seat of the trouble may be easily reached.

Then, in order to spread information quickly in regard to a fire, we have made certain other improvements. Thus, the reserves are divided into patrol districts, with a ranger supervising the patrol all the time. But one can easily understand that, if a ranger is travelling through the forest (there are forests on most of our reserves, although on some there are not), he cannot see very far. As a result, there may be a fire within a very short distance of him and he may not be able to see it at all. Consequently, we are developing a system of lookout points. In districts like those in the Rocky mountains, we can get elevated points from which a clear view can be had without any expense except the trail to get to them. In other cases, more particularly on the reserves in the Prairie Provinces, we are erecting lookout towers. All, except one, are wooden towers, but we have erected one steel tower and it has been so satisfactory that we think it would be advisable to erect steel towers so far as our appropriation will permit. The wooden towers, of course, can be put up for practically nothing, except the cost of the nails and the time of the rangers who erect them. but, in other respects, they are not so satisfactory.

Forest Management in Reserves On the forest reserves, the question of better forest management is an important one. As the Chairman and the Chief Forester of the Commission have pointed out, the Forestry Branch has not been given jurisdiction over operations on the licensed timber berths. But, in regard to smaller operations, over which it has jurisdiction, as well as the disposal of timber on the forest reserves, we require better forestry methods, including brush disposal. To a certain extent these requirements have been carried out.

Power of Example Rather an interesting incident occurred in British Columbia in that connection, which illustrates clearly the value of setting a good example. The Forestry Branch required some logs for one of the houses that was being erected on one of the reserves, and, in the handling of the *débris* from that operation, care was taken to pile the brush in a proper manner. A half-breed who lived in the vicinity, assisted our forestry men in this work. Very shortly after he was granted a permit from the local timber office to cut some timber, outside, but in the vicinity of the forest reserve. He was not given any particular instructions about disposing of the *débris*, but, after he had cut down the trees, he carefully piled the brush in the same manner as it had been done by our men on the forest reserve a short time before.

We have had some success too, in getting such work done by other licensees. While we have not been able to adopt compulsory methods in British Columbia, we have been able to persuade license-holders to undertake to dispose of brush, and, to some extent, we have co-operated with them. Some of the lumbermen, particularly in the coast districts, are now following the practice of disposing of the brush resulting from the previous season's operations, before the dry season in the summer, while there is still some snow on the ground. It will be seen, therefore, that a beginning has been made in the matter of brush disposal and I think that, if we had a little more power to deal with the matter of licensed berths, a very considerable advance might be made in the near future.

**Fire Damage
Slight**

Only one per cent of the Federal forest reserves were damaged by forest fires during the past year, which is a very good showing. I think that, if for a few years more, we can carry on the work of improvement, and develop the organization on the lines we have been following, we will have fair assurance that on the forest reserves, no matter what kind of season we may have, we will be able to control the whole fire situation. Of course the last two years were fairly rainy ones, and so were very favourable in the matter of the prevention of forest fires.

**Additions to
Reserves**

The question of additions to the Dominion forest reserves has been mentioned by Mr. Leavitt, and I would just like to refer to it as briefly as possible. You are all aware that stretching northward from the northern portions of the Prairie Provinces there is a very considerable area of forest. That tract is also a watershed for the rivers flowing north into the Arctic ocean, as well as for the rivers that flow south and east into the lakes which feed such rivers as the Nelson and the Churchill. Each year for the last few years the Forestry Branch has been sending out several parties to examine portions of this tract, to determine whether they should be included in forest reserves, or whether they are of agricultural value, and our recommendations are such as have been given by Mr. Leavitt in his report.

Take, for instance, the area to the west of the Porcupine reservation. The Porcupine reservation is situated on the boundary between Manitoba and Saskatchewan. It is a hilly tract, very much broken, and it forms the watershed for the upper waters of some very important streams. It is one of the main sources of the Assiniboine river, so it is an important tract of land from the point of view of the forester. Then the Pasquia hills to the north of the

Prince Albert line of the Canadian Northern railway are really a continuation of the same range of hills and watershed systems. Going farther west in Saskatchewan the district on the Sturgeon river and the Big river, was examined. This forms the watershed between the waters flowing into the Saskatchewan and those flowing north into the Churchill system, both of which finally reach Hudson bay. These tracts and the Battleford reservation further to the west are practically of the same character. The soil in the Battleford reservation is perhaps of a poorer quality than that of some of the other reservations, and there is more sandy soil in the proposed reservation north of Battleford. That tract, I consider to be one of the most important tracts in the whole Dominion of Canada, inasmuch as it lies immediately to the north and contiguous to a prairie country practically without tree growth. It is also important inasmuch as spruce grows fairly rapidly there and makes very good timber. The spruce that is being cut in the mills at Prince Albert and along the Prince Albert line of the Canadian Northern railway and at other points in that district is of good quality. It is possible, too, to reproduce the stand with equally good timber. The other reserves that we are recommending are some small scattered tracts throughout the prairie. We are trying to assist the settler on the prairie by giving him trees to plant on his homestead. We also propose to assist him by taking charge of some of the sandy, non-agricultural areas scattered throughout the Prairie Provinces, and, by planting trees, furnish a stock of timber that may in time be of some assistance to him in his farm work.

**Reserves in
British Columbia**

Then, the Forestry Branch is recommending that additional reserves be created on the mountainous areas in British Columbia. Of course, the agricultural areas in British Columbia are not large, and, in making examinations, the parties that are sent out, are instructed to carefully exclude all possible agricultural lands, and I think that on the whole these examinations have been carefully and thoroughly made, so far as they can be made at the present time. It is possible, of course, that with the development of the country, there will be some changes in conditions, and perhaps with a better knowledge of agricultural methods we may find, inside of these tracts we have recommended for reserves, areas that might be used for agricultural purposes. But I think that, in the present condition of our country it is a wise policy—and the reference that has been made to the Trent watershed fully justifies the statement—that lands that are clearly not good agricultural lands had better be reserved for the present time for forest purposes.

**Forests not
Included in
Reserves**

Outside of the forest reserves efforts are being made to protect the Crown forests in general, and we have had in the past year one hundred and eighty-five rangers at work in the great Northwest. Then, too, one or two steamers have been kept on Slave river, one on the Athabaska river, a gasolene boat on the Saskatchewan and we are providing two gasolene boats for patrol work in British Columbia. One of the latter is running already. In that way we propose to improve our method of handling the fire question along the great waterways.

**Forest Product
Laboratories**

If you will allow me, I would like to refer to further recent development in the work of the Forestry Branch. The question has arisen as to whether we could not find some better methods of using the forest products that we are getting, some method of utilizing what have hitherto been waste products. We are trying to reduce waste in the forest itself and I think the problem goes further and that we should try if possible to reduce the waste in the use of forest products. To this end, the Minister of the Interior has approved, and we have already made a start on the organization of forest products laboratories. An arrangement has been made with McGill University, in Montreal, to organize these in connection with and in co-operation with the University. The purposes of the forest products laboratories I have set down here briefly, and I think perhaps the simplest way is to mention a few of them.

Such work leads to a better utilization of our forest resources as follows:

1. By finding more efficient methods of manufacture of woods.
2. By the elimination or utilization of the wastes of manufacturing and logging.
3. By finding through a study of their mechanical and physical properties uses for woods not now commercially useful.
4. By finding better uses for woods which are now used to make lower grade commodities.
5. By ascertaining if Canadian woods, either in their natural state or after treatment, may be substituted for imported woods.
6. By studying and developing the fundamental principles underlying the treatment of wood in its use in the manufacture of fibre products—alcohol, turpentine, resin, tar, etc.
7. By serving as a public bureau of information on the properties and utilization of forest products.

8. By co-operating with consumers of forest products in improving present methods of use and formulating specifications and grading rules for commercial woods, materials secured from them (such as gums, oils, resin, etc.) and materials used in the treatment of wood (creosote, zinc chloride and other preservatives).

We propose, in the first place, to begin at once by making tests of the mechanical properties and the strengths of the different varieties of woods. We are already making arrangements for securing samples of Douglas fir from the West and we propose to start upon them and also some eastern woods. We propose to undertake immediately after that, investigations in connection with the use of wood in the manufacture of pulp and paper. We have the plans and proposals for equipment well in hand. Following that, we propose to enlarge the investigations in connection with wood preservation, distillation, chemistry and pathology, so that a very extensive series of investigations into Canadian woods and their properties and one of great use to the manufacturing industries of the Dominion, will be carried on. In taking up this work we are not proposing to duplicate similar work done in other forest laboratories, such as those in the United States or in Europe. Our proposal is to ascertain how the work they have done can be made to apply to Canadian conditions, as well as to develop work they have not undertaken. In no case, even in the United States, have investigations with reference to pulp and paper manufacture been carried out as they should be, and we hope that in connection with our work we shall be able to do something in that line which will be superior to anything that has been accomplished anywhere else.

MR. SIFTON : We shall now have an address by Mr. W. J. Dick, on the work of the Committee on Minerals.

REPORT OF THE COMMITTEE ON MINERALS

MR. DICK said :

The first part of the year 1913 was spent in writing the report entitled *Conservation of Coal in Canada* : revising and bringing up to date information relating to coal mining in Western Canada; and in writing articles for *Conservation*.

In July, while acting in the capacity of guide to the members of the International Geological Congress, during their visit to the coal mines of Western Canada, your mining engineer was able to supplement the information obtained in 1911, regarding the coal mines

in the Lethbridge and Banff districts. This information was incorporated in the report, a brief survey of the important features of which follows :

**Outline of Coal
Report**

The governments, of Nova Scotia, Austria, Australia and Japan and private owners of coal lands in England, Scotland, and in certain portions of the United States, supervise the methods of coal mining used in their respective countries. If it is to the advantage of the governments mentioned to engage engineers to guard against wasteful methods, surely it would be to the advantage of the Dominion Government to do so. In Western Canada there are usually a number of coal seams quite close together, and should the lowest seams be the most desirable with regard to quality and ease of working, there is nothing to prevent the operator from mining them first. In fact, this practice is now being followed in a number of cases in the West. As a result, caving of the measures will render it difficult, and, in many cases, impossible to recover the coal from the upper seams. Owing to the wide distribution of coal and, as leases are granted to any one desiring to mine it, the operator who looks to the future, and mines the coal in a systematic manner, at an additional cost to himself, has to compete with the operator who takes the coal most easily mined. There is, therefore, little encouragement to use other than wasteful methods. A case came under notice where, owing to a great demand for coal, the directors instructed a mine-manager to produce an output greater than the development work justified. The mine-manager was forced, against his better judgment, to obtain the coal wherever he could. Some pillars were extracted and others were reduced to such dimensions that they were not able to bear the weight of the superincumbent strata. As a consequence, there was a "squeeze," and to-day the mine is badly wrecked and much coal has been lost. In this case, the opinion of an Engineering Authority would have stood between the mine-manager and the directors of the company.

**Engineering
Authority
Proposed**

It is proposed that an Engineering Authority be appointed by the Dominion Government to examine and pass upon the methods to be employed at all mines operated under Dominion Government lease, and, that the chief inspector of mines of each province be associated with the Engineering Authority in so far as matters relating to the operation of mines in his province are concerned. It would also be the duty of such authority to investigate all applications for leasing of coal lands and to determine the conditions under which such leases should be granted.

**Regulation of
Water-powers**

It is of interest to note in this connection, that the Dominion Government exercises a stricter supervision over the leasing of water-powers than that suggested with regard to coal ; yet coal is just as important as water-power and, unlike it, can be exhausted. The following is a *résumé* of the manner in which water-powers are disposed of :

All water-powers under Federal control are leased subject to strict regulations, and, before the issuance of a license for the development of any particular water-power site, or for the purpose of storing water, the application has to go through three different stages as follows :

First : The plans have to be submitted to and receive the approval of the Water-powers Branch of the Department of the Interior, which has been established for the sole purpose of investigating these proposed water-power developments, particularly from the view-point of maximum efficiency in conjunction with other power sites on the same or tributary rivers.

Second : Once the plans have been approved, construction work may proceed under government supervision.

Third : After the construction work is completed the license is granted for a limited period, the Government reserving the following rights :

(a) To renew the licenses or not.

(b) To compel the development of sufficient power to satisfy public demands, up to the full extent possible from the amount of water granted.

(c) To stipulate that the rates charged the public for electrical energy or power be controlled by the Board of Railway Commissioners of Canada.

The Water-powers Branch is not only carrying on this work, but is also investigating and planning possible future developments.

During the months of June, July, August, and part of September, Canada entertained the members of the International Geological Congress. The attendance of about four hundred and fifty members, representing forty countries, at the sessions held in Toronto, demonstrated the importance of Canada's coal resources. Excursions were so arranged as to give the visitors a good insight into the geology and the mineral resources of the Dominion. These extended from Sydney, Nova Scotia, on the East, to Victoria, British Columbia, in the West, and to Dawson, Yukon, in the North-west.

A beginning has been made on a "power survey" of the Dominion. It will show the amount, or proportion, of the different kinds of power—steam, water-power, electricity and gas—used in different districts in the several provinces and the purposes for which they are used, together with costs, source of fuel supply, and other particulars which may be of interest.

This survey is being undertaken for the following reasons :

1. All central Canada, from Montreal, Que., to Moose Jaw, Sask., is dependent upon the United States for its supplies of bituminous coal. A power survey of this region would be of great value in determining where substitutes could be obtained and utilized, so as to render Canada less dependent upon a market over which it has no control.

2. Similarly, Pennsylvania anthracite is used from Nova Scotia in the east, to Battleford, Sask., in the west. The supply of this anthracite is limited, and there is no assurance that its export to Canada will be long continued.* Consequently, precise information respecting actual conditions would be very valuable in preparing for such an eventuality.

3. In portions of the Prairie Provinces available water-power cannot be economically developed. Some of these districts are, however, within easy radius of large deposits of lignite. As, in many instances, lignite can not be transported and used economically for generating power under boilers, it is necessary, at present, to use American or Canadian bituminous coal. But, if a fuller knowledge of power conditions were available, there is reason for believing that central power stations could be erected near the lignite fields and this fuel put to economic use.

Briefly, the data collected will prove of value in showing the markets and costs for the different kinds of power used, and, in this way, determine whether other kinds of power could be economically replaced by water-power or by power generated by other means.

During the year, several papers were written and addresses given on the conservation of mineral resources.

* In 1912, it was estimated that there were 16,290,000,000 tons of anthracite in the United States. In 1911, 90,464,367 tons were mined and, as a ton of coal lost for each ton mined is a fair average, the exhaustion is proceeding at the rate of 181,000,000 tons per annum. If production continued at the same rate, it would exhaust the anthracite of the United States in about 90 years. We must, therefore, expect that the price will gradually increase until only the wealthy few can afford it. Coincidentally with the rising price, production will decrease, thus prolonging the life of the mines.

In October, your mining engineer attended the American Mining Congress at Philadelphia where many valuable papers relating to taxation of mining property, administration and disposal of mining property, prevention of mine accidents, conservation, etc., were read and discussed.

A short paper has been prepared on *The Importance of Bore-hole Records and Capping of Gas Wells*, which it is not necessary to read at this meeting, but with your permission, it will be filed for publication in the Annual Report.

Importance of Bore-hole Records and Capping of Gas Wells

BY

W. J. DICK

Mining Engineer of the Commission of Conservation

ACCURATE records of bore-holes made on Crown lands in Canada have never been kept. Abandoned gas and oil wells, as well as test wells, are never marked, and, in time, all knowledge of their situation is lost. With the single exception of Ontario, no province even requires that such wells should be plugged. As a result, such bore-holes become sources of serious danger to those who may be, at a later date, exploiting other minerals in their vicinity. At the same time, the Governments are neglecting a valuable means of obtaining information with respect to the geology of the country.

It is the purpose of this paper, therefore, to show the necessity that exists for filing with the Governments concerned all records of bore-holes made on Crown lands in Canada. While special mention is made of wells drilled in prospecting for natural gas and oil, nevertheless the same arguments hold good, to a greater or less extent, with regard to holes drilled for other purposes such as prospecting for coal, water, salt, etc.

In Manitoba, Saskatchewan, Alberta, the North-west Territories and in the Railway Belt and Peace River Block in British Columbia, mining rights are under Federal control, while in the other provinces they are subject to Provincial regulations. In Ontario, ample statutory provision is made to guard against the waste of natural gas and for the plugging of all abandoned wells,* but no province requires the lessees of mining rights to file a record of the actual situation of bore-holes or logs of bore-holes showing the thickness and kind of formations passed through.

* *Statutes of Ontario*, 7 Ed. VII, Chap. 47, 1907.

In the case of wells drilled for water, etc., for municipal purposes, it would be advisable for the Commission of Conservation to send a memorandum to all municipalities, pointing out the importance of obtaining the bore-hole records and advising them to require this information from the well-drillers as a part of the drilling contract.

For reasons, stated later, and on account of the activity in oil and gas prospecting in provinces in which mining rights are disposed of under Dominion regulations, it is necessary that provisions be made in those regulations covering the recommendations contained herein.

FEDERAL REGULATIONS FOR THE DISPOSAL OF PETROLEUM AND NATURAL GAS RIGHTS

The following is a brief *résumé* of the more important provisions of the Dominion Regulations for the Disposal of Petroleum and Natural Gas Rights.*

1. The petroleum and natural gas rights, which are the property of the Crown, may be leased to applicants at a rental of twenty-five cents per acre for the first year, and fifty cents per acre for each subsequent year, the rental to be paid yearly in advance. The term of lease is twenty-one years, renewable for a further term of twenty-one years, provided the lessee can furnish satisfactory evidence to the Minister of the Interior to show that, during the term of the lease, he has complied fully with the conditions of such lease and with the provisions of the regulations in force from time to time during the currency of the lease.

2. The area leased shall not be greater than 1920 acres and the length of the tract shall not exceed three times its breadth. No person shall be permitted to acquire a greater area except by assignment; provided that a person who has been granted a lease for location, and who subsequently abandons or assigns the same may, after the expiration of twelve months from the date of the lease apply for an area not greater than that abandoned or assigned, provided further that such rights shall not be granted unless all payments on account of rent or other liability to the Crown have been fully made.

3. The petroleum and natural gas rights do not include the surface rights, but provision is made for the acquisition of whatever area of available surface rights the Minister of the Interior may consider necessary for the efficient and economical working of the rights granted.

4. No application for a lease shall be accepted or recorded unless accompanied by the full amount of the rental for the first year.

* *Order in Council*, Jan. 19th, 1914.

5. If during the term, the lessee shall fail to pay rental in advance for each subsequent year, within thirty days after the date upon which the same became due, the lease shall be subject to cancellation at the discretion of the Minister.

6. Provided, that if the lessee, in consideration of the expenditure to be incurred in actual boring operations, makes application, at or before the beginning of the second and third years, respectively, of the term of the lease, for an extension of time for the payment of rental, the Minister may grant such extension in writing ; and if the lessee, before the end of the year in respect of which application was made, submits evidence to the Land Agent of the district that at least \$2,000 has been spent on actual boring operations, the amount expended, exclusive of the cost of machinery and casing, may be deducted from the rental.

7. Within one year from the issuance of the lease, prospecting machinery of the value of at least \$5,000 shall be installed.

8. Within fifteen months, the lessee shall commence boring operations and if he ceases to carry on the same for a period of more than three months, the lease shall be subject to cancellation. Provided, however, that if at least \$2,000 has been expended in actual boring operations, such expenditure shall be accepted as compliance with this provision for the year during which such expenditure was incurred.

9. A lessee, who has acquired by assignment or otherwise, more than one lease may be permitted to consolidate his operations and expenditure, and to install machinery and equipment on one or more of the locations described in the lease affected. Provided that such consolidation shall apply only to the second and third years of the term of the leases and shall comprise only such basis as may at that time, be included in such consolidation. The group shall not exceed an area of 20 square miles, nor shall the locations be separated from one to the other by more than two miles.

10. The lessee shall at all times take reasonable measures to prevent the injurious access of water to the oil-bearing formations. Upon a well proving to be unproductive, or ceasing to yield oil in paying quantity, or being abandoned for any cause, the lessee shall be at liberty to withdraw the casing from the said well, but in order to prevent water gaining access to the oil-bearing formation, the lessee shall immediately close the well by filling it with sand, clay, or other material which may have the effect of preventing water from gaining access thereto.

In case natural gas is discovered the lessee shall take all reasonable and proper precautions to prevent the waste of gas, and his operations shall be so conducted as to enable him, immediately upon discovery, to control and prevent the escape of gas. Should salt water be encountered, the lessee shall immediately and effectively close the well at such a depth as may prevent such water from gaining access to the oil bearing formation.

The Minister may, from time to time, make such additional regulations as may appear to be necessary or expedient, governing the manner in which boring operations shall be conducted, and the manner in which the wells shall be operated ; failure on the part of the lessee to comply with such requirements will render the lease subject to cancellation.

11. No royalty shall be charged upon the sales of petroleum up to January 1st, 1930, but a royalty at such rate as may be specified by Order in Council may be levied on the natural gas products of a leasehold.

12. Any company acquiring leases shall at all times be and remain a British company, registered in Great Britain or Canada ; the Chairman, and a majority of the directors shall, at all times, be British subjects and the Company shall not at any time become, directly or indirectly, controlled by foreigners or by a foreign corporation.

13. The Minister may at any time, if considered necessary by the Government of Canada, assume absolute possession and control of any location, together with plant, equipment, etc.

14. If oil in paying quantities is discovered the lessee shall work the wells uninterruptedly in accordance with the provision of these regulations and to the satisfaction of the Minister so long as the wells yield oil in paying quantities.

15. At the end of each year of the term of the lease the lessee shall furnish a statement, supported by affidavit, showing the number of days during the year that operations were carried on upon the location ; the number of men so employed ; the character of the work done ; the depth attained ; the total expenditure incurred ; a detailed statement setting out fully the purpose for which such expenditure was incurred ; the quantity of crude oil or natural gas obtained ; and the amount realized from the sale thereof. Failure to furnish such yearly return will render the lessee subject to a fine of ten dollars (\$10.00) a day for each day's delay in furnishing the sworn statement, and after three months' delay the lease shall be subject to cancellation.

The provisions of these regulations are such as to encourage prospecting for oil and gas and, to a certain extent, protect the rights of the people. Although the terms of the lease are very favourable to the lessee no provisions are made with regard to obtaining additional information from the lessee for the public good.

The following important provisions should be added to all boring regulations :

1. Exact locations of all bore-holes shall be filed with the Government.
2. Logs of all bore-holes, giving the kind and thickness of all formations passed through shall be filed with the Government.
3. All abandoned natural gas wells shall be plugged in a proper manner prior to abandonment.
4. A royalty shall be levied on natural gas, but subject to a rebate of all or part of the same if the gas is used.

I. RECORDS OF BORE-HOLE LOCATIONS

In order to establish the position of a bore-hole its situation should be referred to a permanent monument erected near the bore-hole. It is also desirable that the position of the monument be referred to a prior land survey or to some prominent landmark or topographical feature. This could be done at little additional cost to the lessee.

Records of all the holes drilled through coal formations in the West should be filed with the Government, in order to protect future coal mining operations. If holes are drilled through coal measures in order to reach the oil or gas zone below, and, after finding natural gas, the casing is withdrawn and the well abandoned, the gas "feeders" will be of great danger to future coal mining unless accurate records are kept.

When one considers that one volume of methane mixed with seventeen volumes of air is inflammable, it can be seen that it requires but a small addition of natural gas to the mine air in order to make the mine unsafe.

The following article on Mine Explosions caused by Gas Wells* shows the importance of keeping accurate records and the necessity for knowing under what conditions the holes were drilled and plugged :

"On Nov. 21, 1912, an explosion occurred in a small country coal mine situated about three miles west of Shinnston, W. Va. Two small boys were killed and the father was fatally burned while attempting to rescue them. Later examination showed the cause

* Mine Explosions caused by Gas Wells. By W. A. Hesse. *Coal Age*, March 22nd, 1913.

to be the escape of gas from a well located about three or four hundred feet away. This well had been drilled to the gas about six years previously, and, about 1910, it was cleaned out and tubed; after which a casing head was placed so as to enclose the gas within the outside casings. In all probability no packers were placed at the bottom of the hole to prevent leakage around the casings.

"Attention has been called to Judge Doty's decision against the Penn. Gas Coal Co., which corporation sought to restrain the Greensboro Gas Co. from drilling a well through their coal without fulfilling a previous agreement to protect their operations.*

EXPLOSION AT A CONSOLIDATED MINE

"The explosion which occurred in two mines of The Consolidation Coal Co., in the Fairmount region, in 1910, was proved to be directly caused by a capped gas well.†

"This well was started with a 13-in. bit and drilled to a depth of about 246 ft., or about 82 ft. below the Pittsburgh coal seam. An 8¼-in. casing was then 'run in' and a cement mixture poured around it, up to some point above the coal. The cover at this point is about 176 ft. thick. When the well reached the gas, a casing head was placed on the 8¼-in. casing. After standing for some time, the pressure reached about 850 lbs. per sq. in.

THE DOWNWARD PRESSURE OF THE MEASURES COMPARED WITH THE UPWARD PRESSURE OF THE GAS

"According to investigations made at Lehigh University a vertical column of coal-measure rock, 176 ft. high and one foot square, will produce, approximately, a compression of 13.3 tons net or about 185 lbs. per sq. in. The gas pressure of the aforementioned well was over four and a half times this amount, and as most of the coal in this neighbourhood was extracted, the chances for the leaking of the gas were highly favourable.

"In June of 1911, the Hutchinson Coal Co. made an opening into the Pittsburgh coal, about 8 miles west of Clarksburg, on the Parkersburg branch of the Baltimore and Ohio railway. After the entries had advanced about 80 ft. a gas explosion blew mine cars and tools out of the opening. Upon investigation the odor of natural gas could be easily detected and a 1-in. pipe inserted into the coal showed a pressure of two-tenths inch water gauge or a flow of about 17,600 cu. ft. of gas per day. It is easy to imagine how large a quantity of gas must have been escaping from the entire face of the entry.

EXPLOSION CAUSED BY A WELL 1,500 FEET AWAY

"A gas well about 450 ft. distant from this opening, and near the outcrop, was uncapped but this had no effect upon the flow of gas. Another well located about 1,500 ft. south was then opened and the flow of gas immediately stopped. No indication of gas has since been found in this mine.

* *Coal Trade Bulletin*, Vol. XXVII, No. 6, Aug. 15, 1912.

† *Mines and Minerals*, Vol. XXXII, No. 1, August, 1911.

"Any gas well of long standing may be considered a menace to coal operations, especially if the gas is confined in the outer casings. The reason follows, reference being made to the sands penetrated in this locality.

"A well is drilled at the commencement with a 13-in. or 16-in. bit and goes to some point between the surface and the Dunkard Sand, depending on the location of water. Ten-inch casing is 'run in' the hole to this depth ; but no packer is placed on the bottom to prevent any possible escape of gas.

"The hole may be drilled on down to the Big Lime and 8-in. casing 'run in' to this point. It is probable that the driller will fail to place a packer on the bottom. The size of the bit and drill is then reduced and the hole extended down to the Big Injun Sand, where a sufficient quantity of gas to warrant immediate piping may be found. But we will suppose that a fair quantity is obtained. The 6-in. casing is immediately run in the hole and the packer placed in some rock just above the point where gas is found. This confines the gas to the 6-in. casing.

"The driller continues down to the Thirty Feet, Fifty Feet, or the Fifth and Sixth Sands, depending on the gas indications and the location. Perhaps 5-in. casing is run in to some point below the Injun Sand to confine this gas between the 5- and 6-in. casings. Then if the flow of gas is not exceptional from the lower sand, 3-in. tubing is run in to the gas-producing sand and the anchor packer placed in some solid rock above.

IF PACKERS DETERIORATE, THE CASINGS CEASE TO PROTECT

"Should this well stand for a number of years, there is little doubt but that the rubber on the various packers may deteriorate to such an extent as to allow the escape of gas around the bottom of the casings to which the packers are attached. It is difficult to say just where this gas will appear, on the surface or in the mine.

"Therefore, a coal operator should know, and has the right to know, as much regarding the conditions and methods, of a well being drilled through the seam of coal he is working, as the person, party or company drilling such a well. Otherwise, he is negligent and, unless he takes sufficient interest in his own property to call attention to these dangers, how can he expect the gas or oil man to care for his interests."

2. RECORDS OF BORE-HOLE LOGS

A well-driller generally keeps an accurate log of the hole drilled, showing the depth of the hole and the thickness and kind of formations passed through. In other words, the log gives a vertical section of the formation at that point. The information thus obtained, if filed with the Government, would prove to be of great value for the following reasons :

The Dominion Government is expending large sums of money in mapping the geology of the country, and the information thus obtained is largely areal. If the information contained in bore-hole

logs were available it could be co-ordinated, and thus facilitate the working out of the stratigraphy, thereby promoting economy and efficiency. The co-ordinated information would not only materially assist the actual drillers in an oil or gas field, but would also be of value to companies contemplating drilling operations in a field that had been drilled before. If the information on file were adverse, it would save such companies much trouble and expense incident upon duplicating the work.

Records of bore-hole logs would also give the Government more information concerning the value of coal seams on public lands. As bore-holes in Western Canada are drilled on lands in which the mining rights are held by the Crown, it would not be too much to ask the drillers to furnish information which they already have and thus make it available for the public good.

3. PLUGGING OF ABANDONED GAS WELLS

In the past, enormous quantities of natural gas have been wasted both in Eastern and Western Canada. In a gas-field, a careless driller may either lose control of the well through carelessness or ignorance, or abandon it without plugging it. Not only is his own property destroyed, but the surrounding area is also drained, thus injuring the entire community through the carelessness of a single individual. His acts thus become a matter of public concern and a proper field for legislative control.

The province of Ontario has reduced the waste of natural gas to a minimum, by causing all abandoned wells to be plugged* and by levying a tax of two cents per thousand feet, with a rebate of 90 per cent, when the gas is used.†

A natural gas well at Pelican portage, Alberta, has been burning and wasting gas for the last fifteen years. Although there is, at present, no market for this gas, such a circumstance demonstrates the possibilities of waste under existing laws. No one can doubt that, in the near future, there will be an enormous market for this valuable mineral resource.

With regard to controlling and capping "wild" wells, Ralph Arnold and F. Clapp in *Technical Paper 38*, United States Bureau of Mines, state :

"The statement is frequently made that the so-called uncontrollable wells in Louisiana and other States can not possibly be controlled. This statement is incorrect, as proved by the fact that one of the greatest 'wild' wells ever known, the Gilbert, was successfully closed by the owners. According to information given the

* *Statutes of Ontario*, 7 Ed. VII, Chap. 47, 1907.

† *Statutes of Ontario*, 7 Ed. VII, Chap. 9, Part II, 1907.

writers by M. B. Carmody, superintendent of the Caddo Gas and Oil Co., the method was as follows : Another gas well about 150 feet from the centre of the crater of the 'wild' well was drilled. An earthen reservoir of about 30,000 barrels capacity was constructed nearby, and was pumped full of clear water from Caddo lake. This water was pumped from the storage reservoir into the new well for a few days ; the pumps were then stopped, the well opened, and allowed to blow into the air for a few days. This procedure was to open a passage through the gas-bearing sand between the 'wild' well and the new well, and was repeated continually until the crater of the 'wild' well showed by its action that a connection had been established. The next step was to lower suction pipes into the new well and to pump in, from the reservoir, water containing a large amount of sediment. This water, being about 90 per cent mud, soon silted up the pores in the sand surrounding the crater of the 'wild' well. As the pressure of the 'wild' well became less the mud and water in the crater sank back to the bottom of the well and filled all open spaces in the sand, thus sealing off the gas.

"The chief difficulty in closing this well is said to have been the great heat to which the workmen were exposed, as the gas in the crater was burning most of the time before the well was effectually closed. After the undertaking was finished the crater measured 300 feet in diameter by 90 feet deep.

"In Oklahoma a 20,000,000-foot well in the Glenn pool caught fire and was put out after several weeks by a battery of boilers, which suffocated the flame with steam. The enormous burning well near Caney, Kansas, was put out by J. C. McDowell, who made a large hood of boiler plate and by means of cranes and derricks dropped it on the well. The first attempt was not successful, as the hood was destroyed by the sand blast from the burning well.* All of the big gas wells of the famous Buena Vista Hills field, California, were got under control, even after catching fire ; the usual method was to extinguish the fire by steam and then to shut the gas off gradually by means of heavy anchored valves. Evidently, even the 'wildest' burning wells can be effectually controlled by proper methods.†

"The laws of Pennsylvania, Ohio, Indiana, and California provide for the efficient capping of every gas well when not in use. There should be similar laws in all States having gas fields. If the owners emphatically refuse to close their 'wild' wells, the Louisiana remedy can be applied ; that is, empower a State commission to close the wells and levy the cost on the companies. In Louisiana, the Commission on the conservation of natural resources, after making an exhaustive examination of the situation in the Caddo field, recommended :

" 'That the owners of the wild wells in the Caddo field be at once notified to take immediate steps to close the same ;

* McDowell, J. C., *The Maggie Vanderpool Oil and Gas Man's Magazine*, July 23, 1908, pp. 41-48.

† A technical paper on the control of gas wells is to be published by the United States Bureau of Mines.

“ ‘That in the event of their failure or refusal to do so, the State, through its engineering department, forthwith take steps to bring about control of the wells and stop waste at the expense of the owners ;

“ ‘That if it be found that through failure of the law or otherwise the State can compel owners to bear the expense, then, and in that event, the State interest is sufficient to warrant the State in going to any reasonable expense to close the wells at the public cost.’

“The State of Louisiana has not been called upon to close any ‘wild’ wells, for the reason that all but one have been closed by the owners, and in this one the gas escapes from a shallow sand, 900 feet above the supply which is used commercially. In March, 1912, no wells from the deep sand were running wild.”

The following extract from the rules and regulations* adopted by the Conservation Commission of Louisiana applies to the manner of plugging gas wells :

“No person, firm or corporation having possession or control of any natural gas well, whether as contractor, owner, lessee, agent or manager, shall allow or permit the flow of gas from any such well, to escape into the open air, for a length of time not exceeding two hours after it has cleaned itself, and thereafter all such gas shall be safely and securely confined in such wells, pipes or other safe and proper receptacles.

“It shall be the duty of any person, firm or corporation having the custody or control of any well which has been sunk, for the purpose of obtaining natural gas or oil or exploiting for same, and which has been abandoned or ceased to be operated for utilizing the flow of oil or gas therefrom, and also the owner or owners of the land wherein such well is situated, to properly and securely stop and plug same as follows : A string of pipe shall be brought as near the bottom of the hole as possible and heavy drilling mud pumped down the pipe and circulated in the borehole for a considerable length of time, after which one string of casing can be removed. This process must be repeated for each string of casing until the hole is filled. In cases where high pressures have to be dealt with, the surface casing must also be left in the hole and a plug screwed in the top thereof. Notification must be made to the Commission of the date on which a well is to be abandoned, in order that it can be properly closed under the supervision of the Inspector in charge. All expenses incidental to the closing of wells must be borne by the owner or owners.”

At a meeting of the National Fuel-well Committee (United States) on March 11th, 1913, an Act was prepared to regulate the drilling of oil and gas wells through coal. The more important provisions† are as follows :

* *Rules and Regulations Relative to the Protection and Conservation of Gas and Oil Fields of the State.* Conservation Commission of Louisiana, 1913.

Coal Age, March 22nd, 1913.

LOCATION OF WELL

"License—Section 1. When a location for a well has been made, the well operator shall make application in writing to the chief well inspector, for a license to drill, and send therewith a description and plat in duplicate of the proposed location.

"Survey—Section 2. The location shall be determined by survey, and the description and plat shall give the courses and distances from two permanent points on the boundaries of the tract of land upon which the well is located, together with the name of the tract of land, names of adjoining tracts, township or district and county.

"Copies of Plat—Section 3. The well operator shall send to the coal operator, if known, and to the State coal-mine inspector, a copy of the description and plat filed with the chief well inspector.

"Verify Location—Section 4. Immediately on the receipt of the plat the coal operator shall verify the well location and mail, to the well operator, a plat showing the present and proposed mine workings under the tract of land on which the proposed well is located.

"Time Limit of Complaint—Section 5. The license to drill shall issue immediately on the expiration of five days (excluding legal holidays) after the application and the plat of location have been received by the well inspector unless he makes or shall have received notice of complaint during that time.

"Time Limit to Issue License—Section 6. If notice of complaint is made by or served on the well inspector within the said five days, then it shall be the duty of the well inspector to confer with the several interests, including the State mine inspector, coal operator, well operator, and where possible the owner of the land and of the royalty interest, and designate, within 10 days of the receipt of the application for license, a suitable location for the well, or if no well can be drilled on the premises because of conditions hereinafter specified, refuse to issue a license to drill.

"Re-survey—Section 7. If the well is re-located, a re-survey shall be made by the well operator, and corrected description and plat mailed as previously required.

"Mine Plats—Section 8. Each coal operator shall furnish annually to the inspector a plat of all of his present and immediate projected mining operations within the State showing the location of all known wells. The coal operator shall also furnish, if requested, to any well operator, a plat of the mine under the leases or property owned or operated by the said well operator.

"Distance from Buildings, etc.—Section 9. No well shall be located within 300 ft. of a hoisting or air shaft, slope or drift into an artificially ventilated coal mine when not definitely abandoned or sealed, nor shall such well be located within 300 ft. of any mine shaft house, boiler house, engine house, power house, mine fan, or mine tiple, unless such structure has been abandoned.

"Distance from Mine Ways—Section 10. No well shall be drilled within 15 ft. of any underground haulage way, travelling way, drainage way or air way.

"Display of License—Section 11. It shall be the duty of the chief well inspector to issue the license in duplicate, and the well operator shall display at the location, one copy of the license properly protected from injury, and in such place and manner that it may be easily seen.

"Duration of License—Section 12. The license shall expire at the end of one year from the date of issue unless drilling operations are actually in progress.

MANNER OF DRILLING AND PROTECTING WELL THROUGH WORKABLE BEDS

"Section 1. Each well passing through a workable bed of coal shall be drilled, cased and protected in the manner hereinafter provided :

"(a) Where the coal is in place.

"A hole of a diameter 6 in. greater than the inside diameter of the outside casing to be put through the coal shall be drilled at least 30 ft. below the bottom of said coal bed.

"Within this hole shall be placed the casing, and the space between the outside of said casing and the wall of the hole shall be filled with cement mortar, or puddled clay, to a height of at least 30 ft. above the top of said coal bed, to exclude water from the coal bed.

"(b) Where the coal is removed and the mine excavation is inaccessible:

"A hole of a diameter sufficiently large to permit the setting in of a liner 4 in. larger in diameter than the inside diameter of the casing to be put through the coal, shall be drilled at least 30 ft. below the bottom of said coal bed.

"Within this hole shall be placed a liner 4 in. larger than the inside diameter of the said casing and extending from the bottom of said hole to at least 30 ft. above the mine roof.

"A string of casing centrally guided by shoes or winged guides shall be placed within the said liner and the space between the liner and the casing shall be filled with cement mortar or puddled clay to the top of the liner.

"To exclude water, the space between the said casing and the wall of the hole and immediately above the top of the liner, shall be filled for a distance of at least 10 ft. with cement mortar or puddle clay.

"(c) Where the coal is removed and the mine excavation is accessible, the method may be either as provided in the case of inaccessible mine excavations or as where the coal is in place, provided that if the latter method is chosen the well operator shall at his own expense provide a suitable retaining wall laid in cement mortar to retain the cement mortar or puddled clay about the casing. This wall shall extend from 2 ft. below the mine floor to the roof of the mine, and be of such size as to retain at least 2 in. of puddled clay or cement mortar about the said casing.

"Affidavit as to Casing—Section 2. The well operator shall upon completion of the work of casing through a coal bed make an affi-

davit signed by two men having at least three years' experience in casing wells as to the method of casing and protecting the well ; said affidavit to be filed with the chief well inspector.

"*Vent*—Section 3. Under any of the above provisions the work of casing and protecting from gas and water through the coal bed shall be completed before the well is drilled to a greater depth ; and in the event of any well being productive of oil or gas, the space between the said outside casing and the next string of such other casing as may be left in, shall remain open, the top being provided with a suitable device to permit ventilation and at the same time to prevent dirt or *débris* from falling in, or being thrown in, or the ventilating opening from being readily closed.

ABANDONMENT OF WELL

"*Notice*—Section 1. The well operator when he purposes to abandon any well, shall send a written notice of his intention to the chief well inspector, and the work of plugging the hole or pulling the casing shall not proceed until the well inspector is present to see that said plugging is done as prescribed by this Act, except as hereinafter provided.

"*In Absence of Inspector*—Section 2. In case the well inspector fails to be present within three days from receipt of notice, then the work may proceed provided that two men having experience of at least three years in the plugging of wells be present, and make affidavit in duplicate that the work was done in accordance with the provisions of this Act, said affidavit to be filed with the chief well inspector, and made a record of his office.

"*Copy of License*—Section 3. The well operator shall send to the chief well inspector with the notice of abandonment, a legally certified copy of the license to drill, provided the well was drilled under the provisions of this act.

"*Locating Old Wells*—Section 4. If the well was drilled prior to the passage of this Act, the well operator shall send to the chief well inspector, with the notice of abandonment, a description and plat showing the location of the well as herein provided for in the application for license to drill.

"*Method of Plugging*—Section 5. Every well upon abandonment must be plugged and filled solidly and tightly from the bottom to the top as follows :

"The hole must be filled with rock sediment, sand, clay or other suitable material from the bottom of the well to a hard and firm stratum below the last string of casing set in above the producing oil or gas sands. When the well inspector declares that it is impracticable to fill the cavity in the lowest producing sand then he shall permit the well operator to place plugs at the top of the lowest producing sand and fill as hereafter specified.

"In this firm, hard stratum three seasoned wood plugs of a diameter equal to the diameter of the hole, and each of a length of at least 3 ft. shall be driven into place. Above the third plug 10 ft. of clay must be placed and thoroughly tamped down so as to prevent the passage of oil, gas or water.

"Immediately below the seat of each and every string of casing there shall be driven a seasoned wood plug as described, and all spaces between wood plugs shall be filled solidly and tightly with rock sediment, clay, sand or other suitable material as the casing is withdrawn length by length. All plugs shall be driven in place with proper drilling tools.

"In the case of a well in which the outside casing has been cemented as heretofore provided, said outer casing may be cut off at a point not less than 50 ft. above the coal bed and removed, but in any event the hole shall be filled to the surface.

"The location of the plugs herein provided for are made with reference to the relative positions of the workable coal beds and the gas and oil sands, for the purpose of preventing the passage of oil or gas into the workable coal beds and of water into the oil and gas sands, and if any well presents a variation in such relative positions of the said strata, such additional wood plugs as the well inspector may deem necessary shall be driven into place by the well operator.

"*Report of Plugging*—Section 6. When the work of plugging and filling from bottom to top has been completed, the well operator, or his authorized agent, shall make a report in duplicate to the chief well inspector, upon forms to be furnished by the well inspector, showing the date of completion of the well, the depths of the coal beds, the names of, and depths to, all productive oil or gas measures, the total depth of the well, and the location and kind of all plugs and fillings used, and the method followed in placing the same.

"Section 7. If the well inspector has been present during the performance of this work, he also shall sign the report to the chief well inspector.

"Section 8. If the well inspector has not been present, this report shall be joined in by two men employed on the work as provided for in this act.

"*Protection of Casing by Coal Operator*—Section 9. When the coal is removed from around a well casing or liner, the coal operator shall protect the same from corrosion and mechanical injury by a wall of suitable material to retain 2 in. of cement mortar between the said wall and the said casing or liner; this protection shall extend from 2 ft. below the mine floor to the roof of the mine, except in the case of an abandoned well, which has been plugged and filled as prescribed in this Act.

4. ROYALTY ON NATURAL GAS

A royalty should be levied on all natural gas obtained from an oil or gas well. The purpose being not to raise a revenue by such tax, but to guard against waste. All or part of the royalty should be refunded if the gas is used for other than wasteful purposes.

In Ontario, an Act* was passed in 1907, levying a tax of two cents per thousand feet on natural gas with a rebate of ninety per cent when the gas is used in Canada.

* *Statutes of Ontario*, 7 Ed. VII, Chap. 9, Part II., 1907.

Tuesday Afternoon Session

The Commission resumed its deliberations at 2.30 o'clock p.m., the Chairman, Hon. Clifford Sifton, presiding.

MR. SIFTON : We shall now have an address from Mr. W. S. Haskell, Counsel for the American Game Protective and Propagation Association, on "The Protection of Migratory Birds." The address will be illustrated by lantern slides.

Protection of Migratory Birds

AN ADDRESS BY

WILLIAM S. HASKELL

*Counsel for the American Game Protective and
Propagation Association*

MR. CHAIRMAN and gentlemen of the Commission of Conservation : Last March the Congress of the United States passed what has been called the most far-reaching game protective measure which has ever been enacted into law. It is called there the *Federal Migratory Bird Law*. While the illustrations which I will show to-day are principally to elucidate another subject, yet your Chairman asked me if I would briefly speak to you about this law, and explain to you wherein it benefited the people of Canada, if anything, more than it does the people of the United States. He desired to have me try to interest you in order that you may interest the people in the various provinces and assist in procuring a convention or treaty between Great Britain and the United States, so that that law will remain a permanent one, benefiting both countries.

Efforts to Secure Legislation

Ever since 1904, efforts have been made to enact a migratory bird law. At first, a bill was introduced in order to educate the people, to get discussion of the idea with a view to bringing out any weak points in it and ascertaining what opposition there might be to it. The principal opposition seems to have come from the jealousy of the States, because they thought their rights would be trespassed upon by the Federal Government. That, you know, has been a source of trouble in the United States and has prevented the enactment of a great many wise measures, which would be of great benefit to the entire people. The States-rights men took the position that the power had never been given to the Federal Government by the Constitution, to enable Congress to pass such a law, and there was a great deal of discussion, a great deal of argument. When the organization which I represent, the American Game Protective and Propagation Association, came into existence in the latter part



Commission of Conservation

Courtesy Wm. S. Haswell

SECOND GENERATION OF REEFED GROUSE BREED SUCCESSFULLY IN CAPTIVITY

The chicks in this pen are now full-grown birds and apparently normal and healthy in every particular.

of 1911, it took up this matter with a view to focussing the support and getting the bill enacted into law. We were able to get hearings at Washington and at these hearings we had representatives from forty-four of our forty-eight States. The hearings lasted the entire day, and were conducted both before the House Committee and the Senate Committee on the same day, the speakers going from one committee to the other. The committees made favourable reports and, finally, the bill became law. That law placed under the Federal control all migratory birds, the insectivorous birds and the game birds.

It does not require argument with you, I know, to support the contention that Canada is as much benefited, if not more so, than is the United States. You know the value of the insectivorous birds. I understand that you have recently, in the vicinity of Ottawa, had trouble with the tent-caterpillar. Those birds destroy these caterpillars. This law gives absolute protection to the insectivorous birds. There is a permanent close season for them in the United States. It has been estimated by experts in the United States that, at a conservative estimate, there is an annual loss of \$800,000,000 through the depredations of insects upon crops and foliage. It has also been stated that if all bird life were destroyed, in seven years there would be no vegetation.

Value of Game Birds

With reference to game birds, they are of value for the sport they furnish, as an important source of food supply, and in many ways they are useful also because they, too, destroy harmful insects. Canada is the great breeding ground of many of these birds. They breed here, and winter in the southern portions of the United States and Mexico. On their return to the breeding grounds here in the springtime, they have, heretofore, been shot. That is of course, the time when they mate and by that shooting, not only one, but sometimes families of birds, have been destroyed. While many of the States have laws prohibiting spring shooting, some of them have refused to make such laws ; they are not willing to give up their pleasure for the benefit of all. This Federal law compels them to do so, and under it, the Department of Agriculture has made a close season in the spring. That means that you will have more birds here next spring than ever before. There will be more breeding here, there will be more returning to the south in the fall.

Advantages of Treaty

Now, if a treaty is made such as is suggested, the question of whether or not the Federal Government has any power to make such a law will be forever settled, because a treaty is the supreme law of the land and no

State or Federal court can attack it. That is one of the reasons why we urge that you use your influence in having Canada join us in making such a treaty. Under its terms, you would assure the permanency of this law to the United States, and you would join us in further extending the protection to these birds. You would also join us in prohibiting the exportation of game or eggs illegally taken. You would join us in obtaining an extension of the refuge system which I know is in vogue here as well as in the United States. In fact, I know of no disadvantage to Canada which would accrue from such a treaty. It is, if anything, all in favour of Canada, and I hope that you, gentlemen, will use whatever influence you have, by discussing the matter and educating your people in the various provinces to arouse sentiment in favour of such a treaty. I hope, too, that you will petition the Dominion Government urging that it do what it can to press this matter, by requesting Great Britain to have its representative negotiate with the representative of the United States, so that such a treaty may, at a very early date, become a reality and so that we will know there will be no danger to the migratory birds in your country this coming spring.

Passing from that, I desire to describe the movement in the United States, towards the protection of wild life, especially the constructive work that has been and is now being carried on to increase it.

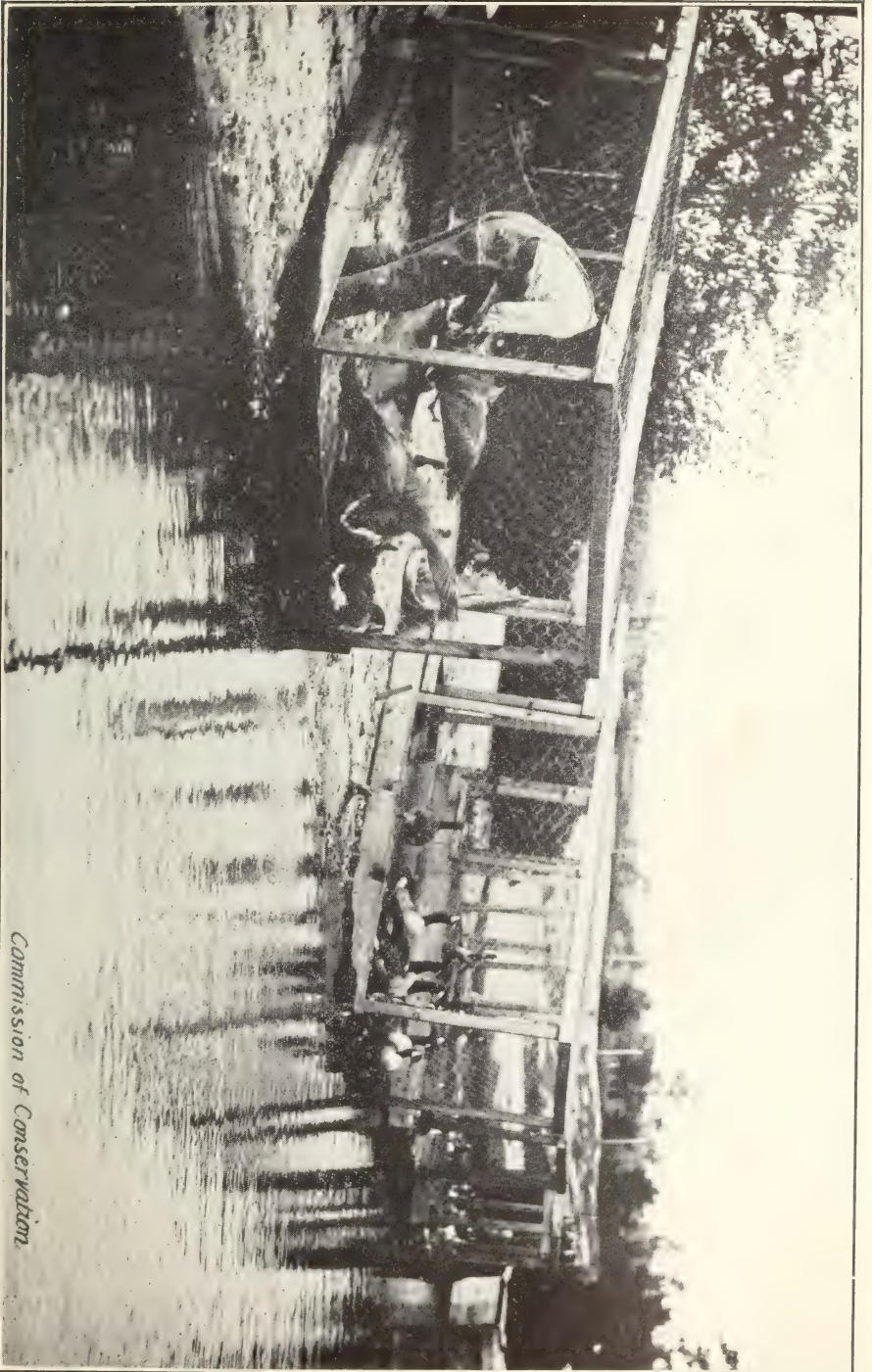
THE NATIONAL MOVEMENT FOR WILD LIFE CONSERVATION IN THE UNITED STATES

We preserve wild life by propagation and by maintaining refuges where the game and birds shall not be disturbed, and from which the surrounding territory will be restocked by the overflow from these protected areas.

National Sanctuaries

The United States has now almost one hundred national reservations which afford such refuges. During the last ten years, they have also established by executive order about sixty-four bird refuges, scattered throughout our country for the purpose of affording protection to important breeding colonies. There are a number of such reservations in Alaska, on the islands off the coast of California and in the Hawaiian islands. In all of these, the game and birds live and breed under the care of wardens, free from any disturbing interruptions.

Many of the States have set aside lands for similar purposes. Pennsylvania, I am informed, leads in the establishment of game refuges. This State has acquired about a million acres of forest



Commission of Conservation

Courtesy Wm. S. Haskell

WILD GEESSE BEING CUT PREPARATORY TO SHIPMENT.

land, called State Forest Reserves, scattered through twenty-six of the sixty-seven counties of that State. Five great game preserves, or refuges have been established in favourable localities in them. In the centre of a great forest reserve, the State Game Commission has selected a specially desirable tract of woodland, and has marked its boundaries by the stringing of a single heavy wire, surrounding the entire refuge. Within the boundary wire, all wild life, except vermin, has an absolute sanctuary, and within this area no one is allowed to hunt or fire a gun. Even in the open season, when hunting is allowed in the State Forest Reserves, it is prohibited here. So the region surrounding them now teems with deer, grouse and other game. The Game Commission intends to increase these preserves until there is one at least in each county.

The state of New York has set aside for such a reserve the Adirondack State Park, containing about one million three hundred thousand acres of forest lands, with numerous lakes and streams, but has not yet adopted the refuge system. A bill granting power to the Conservation Commission to establish such refuges will be introduced within a few days. Montana and Wyoming have similar State preserves. Louisiana and Florida have also large areas devoted to wild fowl refuges, and there are many others.

Associations, clubs and individuals have, in many States, acquired either by sale or lease, land which is used for game refuges. On most of these no shooting whatever is allowed. On some, game is propagated and shooting is allowed in the season.

Aims of Game Protective Association About two years ago, the American Game Protective Association was organized by the co-operation of eleven companies that manufacture fire-arms and ammunition, which desired to contribute to the cause of wild life preservation. While there have been numerous similar associations in the field, yet none of them have been so organized and backed with capital that the permanency of their work is assured.

The chartered objects of this Association are :

- (a) To preserve and propagate game and fish.
- (b) To urge enactment of proper laws to that end and to obtain uniformity of such throughout the country.
- (c) To co-operate with and assist the proper authorities, clubs, associations and individuals in enforcing these laws.
- (d) To establish and maintain preserves and reserves where game may be protected.
- (e) To awaken public interest in the work of protecting and propagating wild life and to demonstrate that propagation is a

practical means of increasing the general food supply and can be made commercially successful.

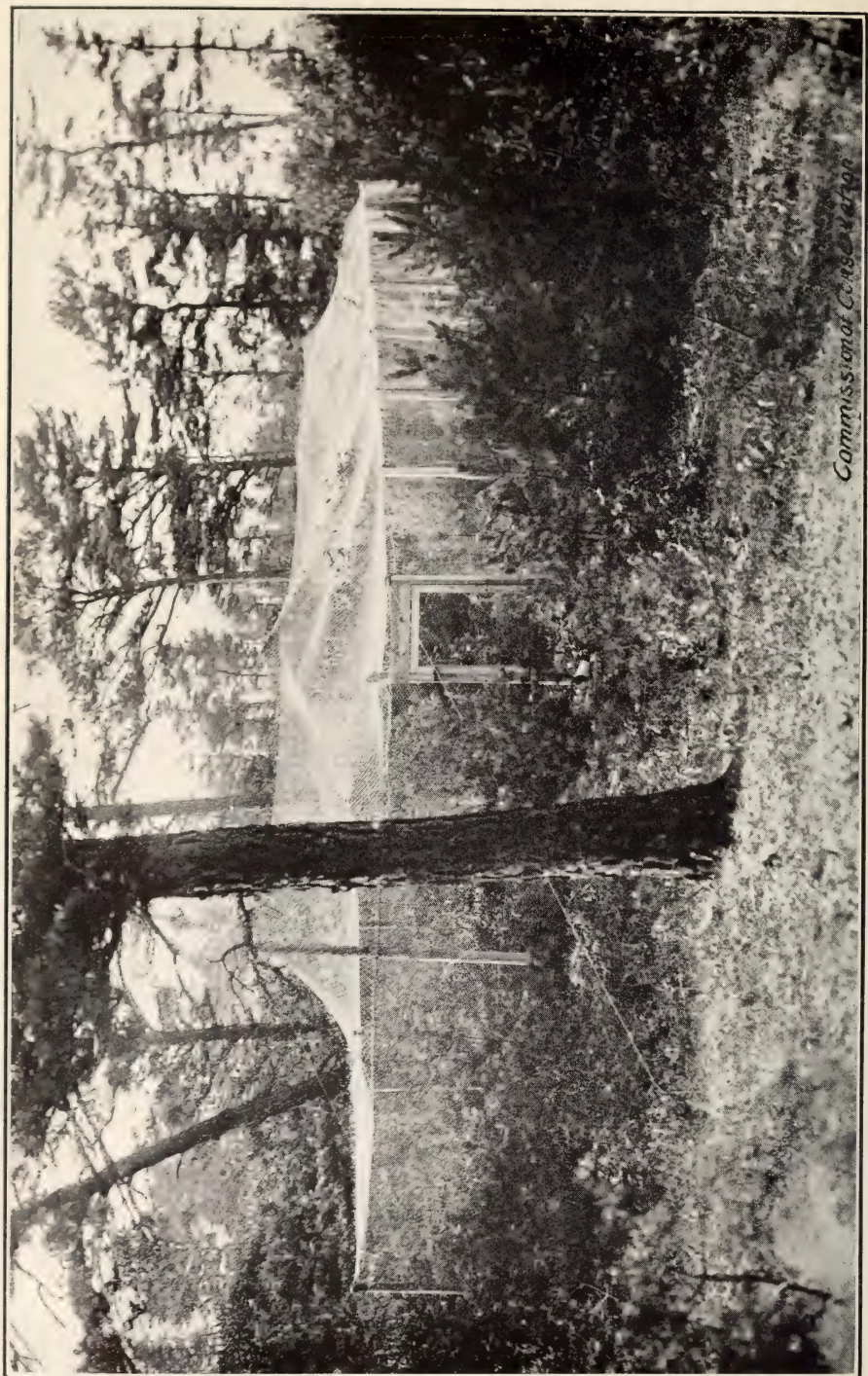
East Head Game Farm

Obtaining a six thousand acre tract of land in Massachusetts, in the towns of Plymouth and South Carver near cape Cod, the Association established a propagation plant, and began to raise game birds with the view to sending them to its members throughout the country, who would protect them in refuges, enable them to increase, and in due time release them in order that the covers might be restocked. This farm, known as the East Head Game Farm, has numerous lakes, ponds, and pond holes which are natural feeding grounds for wild fowl. The natural cover is excellent for quail and grouse, and these birds are numerous. It has, within its borders, a large tract of wild land wonderfully suited to the heath hen, which is now extinct on the continent of North America, but which is being propagated at Marthas Vineyard, with a view to again introducing it. The region is also well suited for the needs of pheasants, for thousands of them have been raised year after year during the last ten years and they winter well there.

A forest nursery has been set out on the farm, and, from time to time, trees will be transplanted from this nursery to various parts of the property with a view to reforesting that portion of the tract where the trees have been destroyed by forest fires. Shrubs, such as barberry, hawthorn and sumach, which furnish food for upland birds have been planted. Buckwheat and other grains are raised for the birds. Wild celery has been planted in many of the ponds, and grain is thrown in and around them so that the water fowl will remain and nest in the vicinity. English ringnecked pheasants in large numbers have been raised during the last year and a half. Mallard, pin-tail, black and wood-ducks, wild turkeys, Canada geese, snow geese and, most important of all, quail and partridge have been successfully raised.

Artificial Propagation

All game protectionists are now agreed that the game laws of the past have failed to prevent the rapid decrease of the game, and that the two most important measures for its protection and increase, are the propagation of game by means of the game sanctuary. As the East Head farm is within a few miles of the sea, near the base of cape Cod, and almost directly in the line of flight of birds from cape Cod to Buzzard bay, it affords a natural refuge for the wild fowl, which pass there in large numbers, in their migrations, and find shelter and food during storms at sea. The land is posted, and no shooting, except to de-



Courtesy Wm. S. Haskell

PEN USED FOR BREEDING GROUSE

It is covered with cotton netting to prevent the birds injuring themselves when they fly.

Commission of Conservation

stroy vermin is allowed. This is the most important refuge for wild game in the Northern States and corresponds with the Ward-McIlhenny refuge in Louisiana. If similar ones can be established at suitable intermediate points on the Atlantic coast, the question of wild fowl conservation will be determined. This will have to be done by private capital, as there is no prospect of Federal or State action along that line.

With the permission of the fish and game commissioners of the state of Massachusetts, eggs of the native quail and ruffed grouse were taken from nests on the farm and in the immediate vicinity. These were placed under bantam hens, and from those hatched during the first year, a substantial breeding stock of quail and partridge was obtained. During the second year, the eggs were taken from these birds and placed under hens. By this method, it was possible to get seventy-five or more eggs from a quail and a very substantial number from the ruffed grouse. The young birds are fed on ants' eggs, chopped hard boiled eggs and specially prepared foods. They find much insect life which is their natural diet, and they have access to plenty of green stuff. During the last season, from a clutch of eighteen quail's eggs hatched under a bantam, seventeen quail are now living, and seven young birds from a clutch of eight eggs of the ruffed grouse were hatched under the hen and are now living. All these birds are strong and healthy, and, barring accidents, will furnish good breeding stock for next season. This second generation of ruffed grouse has created much comment and interest.

Good roads run to the farm, and a very comfortable bungalow has been built for the use of visitors who desire to study the methods employed there, as it is the intention of the Association to give instructions to those who wish to start similar farms or sanctuaries. In this way, it is hoped that such will become common throughout the United States.

State Sanctuaries One of the directors of the Association made a study, this last summer, of conditions in the state of Connecticut and found that there was available about one-third of the entire acreage of the State suitable for game sanctuaries and game farms. This land was not suitable for agriculture, and, therefore, was of comparatively little value. It is his plan to induce public spirited citizens of the State to acquire such tracts, with the view to having numerous sanctuaries where game may increase, and thus restock the covers.

In Massachusetts there are about 2,000,000 acres of forest land. Several years ago, Mr. E. H. Forbush, the State ornithologist, made

a canvass of the public lands of that State, which have been made game bird reservations under the law, and he found that there were about 50,000 acres of such lands, all under protection of the State authorities. He thinks that, without interfering with its value for forestry purposes, at least 1,000,000 acres might be made available for refuges for the protection of wild life.

In the state of Vermont, there are large tracts of timber and abandoned farm lands which would make good game refuges, some of them ranging in area from five to fifteen thousand acres. Under the law of this State, the authorities may establish such refuges, and one has just been so established.

Undoubtedly, inquiries now being made by the Association, will develop similar conditions in almost every State. Efforts will be made to have such lands set aside for game refuges.

**Wild Ducks
from Manitoba** About two years ago, two public spirited citizens, interested in wild life conservation, acquired about four thousand acres of waste land in the state of Connecticut, with a view to establishing there a sanctuary for wild fowl, and of increasing the supply of game by scientific propagation. They sent an expert to lake Winnipegosis in Manitoba to study the habits of the ducks that nest and breed in that region which is in the heart of the great duck breeding grounds of this continent, and to bring back young ducklings to form a nucleus for the propagating work.

About thirteen different species, including a considerable number of canvas-backs, were thus procured, pictures were taken showing their nests, and the situations and conditions surrounding the breeding places of these birds have been reproduced on the Connecticut farm. A certain number of them are pinioned, so as to supply a breeding stock, but a large majority so raised are allowed to migrate with the wild fowl which come to the refuge on their migrations. The birds born and bred in the refuge return to it on their flights north, knowing that they will find protection in their old home. The experiment has been most successful and is encouraging those who feel that propagation is one of the very important measures which must be undertaken to restore the wild bird life to the United States.

Under the Weeks-McLean Migratory Bird Law, which the American Game Protective Association was instrumental in having passed at the last session of Congress, the Mississippi river between Minneapolis, Minn., and Memphis, Tenn., and the Missouri river between Bismarck, Nor. Dak. and Nebraska City, Neb., are made

Courtesy Wm. S. Haskell

PARTLY GROWN YOUNG MALLARDS IN A FAVOURED HAUNT



Commission of Conservation

refuges for all migratory birds. With the awakening of public interest evidenced by the strong support given by people in every part of the United States in the campaign for the enactment of this law, which has been referred to as the most important game protective measure yet enacted, those interested in the preservation of wild life have been encouraged in the belief that these ideas of artificial increase of the game supply, by propagation and by its natural increase with the help of such refuges, will soon restore our wild bird life so that its extinction will be impossible.

DR. C. C. JONES : Mr. Chairman, I would like to say a word in appreciation of the excellent address that we have just listened to. The subject matter of the address falls naturally under the purview of the Committee on Fisheries, Game and Fur-bearing Animals. However, I am sure that every member of the Commission is in sympathy with the objects of the movement concerning which Mr. Haskell has just spoken. I am sure too, that we are all in sympathy with his desire to have the Dominion and Provincial Governments co-operate with the Government of the United States for the protection of migratory birds. At the proper time, therefore, I shall have pleasure in presenting a resolution for the approval of the meeting, setting forth a request to the Dominion and Provincial Governments to take action in this important matter.

MR. SIFTON : We shall have an address by Mr. J. Walter Jones on Fur-farming.

Progress of Fur-farming in Canada

BY

J. WALTER JONES

MR. CHAIRMAN and gentlemen : Fur-farming in Canada has developed considerably during the past year. During the year the silver fox, in which, I suppose, there is more interest taken than in any other species of animal being farmed, has increased in price from ten per cent to twenty per cent, and the demand seems to be a little keener this year in proportion to the supply, than it was last year. Probably thirty per cent of next year's crop is already contracted for and partly financed. The industry is not controlled by any one group of speculators, but that percentage about represents the general demand of the people who come and visit the province with the intention of buying foxes. The breeders have been enabled to put their prices up because the demand has been so great.

Increase in Number of Farms

The number of farms in Canada on which these animals are kept has greatly increased. If one were to look over the statistics from the various provinces, one would find that there are licenses in Nova Scotia for possibly one hundred and fifty fur farms ; in New Brunswick, for a similar number and in Prince Edward Island, the number has probably increased three-fold or four-fold during the year, while in all the other provinces of Canada fur farms have been established.

The plan of organization is, of course, to form joint stock companies. Early in 1913, I would say that as much money had been expended by Prince Edward Islanders in bringing foxes from outside the province, as there has been invested in the industry within the province. During the last year the Island has profited greatly because considerable money has come from outside sources.

For the beginning of this industry credit must be given to two pioneers, Messrs. Dalton and Oulton ; Dalton in Prince Edward Island, and Oulton in New Brunswick. Messrs. Beetz and Burrowman also had a great deal to do with the early development of the industry in Quebec and Ontario. Mr. Beetz offered his farm for sale a year ago and Mr. Burrowman has already sold out. In the main, however, the industry is centred in Prince Edward Island, and for a long time to come, people the world over, who desire high grade breeding animals will come to the Island for them. So that in addition to the fur business the farmers of the Island are engaged in supplying breeding animals to stock other farms.

Hunting and Trapping

Another point to consider in connection with fur production is that hunting and trapping are undoubtedly cruel methods of obtaining fur. An animal falls into a trap and stays in it, three, four or perhaps even five days, with its bones crushed and protruding through its skin, struggling to get free, until it is finally frozen to death, or attacked and killed by its natural enemies. We have laws to prevent cruelty to domestic animals. Why should we not also have them to prevent the cruelty practised on wild creatures ? It is surely about time that wild animals were left alone or brought into fur farms and killed by proper methods, namely, in lethal chambers.

Permanency of Industry

A question often asked is : How long will the fox farming industry last ? So far as the breeding of silver foxes is concerned, it would depend upon what price the fur would bring when the pelts are placed on the market. At the present time, there are about sixteen hundred silver foxes in captivity, in the world.* That is a comparatively small number indeed, when

*The fox census taken in Prince Edward Island in August, 1913, showed that 1325 silver black foxes were being ranched in that province alone.—Ed.

it is remembered that three million fox skins* are marketed yearly, in London. As the number of silver foxes in captivity is increasing at the rate of about one hundred per cent yearly, next year there will be three thousand two hundred silver foxes in captivity, and so on. Now, if one hundred thousand† additional skins were placed on the market, what effect would they have on prices? Mr. Hutchinson Harris, London broker of the Hudson's Bay Co., has told me that he did not think that he would ever see silver fox skins selling for less than one hundred dollars each. If that should be the case, the industry should continue to be a profitable one. Discussing the matter in detail, Mr. Harris said, that the red foxes would not be as popular as the silver, because most people do not like that colour. As proof of this, he instanced the fact that, last September the furriers made preparations to popularize red fox furs. In October, they bought large numbers of red fox skins, but, in less than a month, it was known that the attempt would end in failure. The January, 1914, sales also showed a decline. In the case of silver fox fur there is no such prejudice, and, as the colour is generally becoming to ladies, they will pay five or six times as much for silver as for red fox. So that there is reason for believing that the industry will be a permanent one, even if foxes are the only fur-bearers farmed.

Of course, the whole basis of this industry rests upon a continuance of the demand for furs. The past year has been a trying one for many engaged in the fur business. A period of financial stringency, such as we have just been passing through, reacts most seriously on those who deal in luxuries, such as, for example, costly furs. During the past year, too, the prices of furs have been exceedingly high, in spite of the fact that, in 1913, two or three firms in Leipzig, Germany, failed, throwing on the market at reduced prices, \$4,000,000 worth of furs. The price of silver fox advanced forty per cent and of cross fox fifty per cent. It is well known that furs of good appearance are extremely scarce at present. Nearly all the stocks of furs to-day are comprised of cheap skins, dressed and dyed. A few staples may still be had, but these are rapidly becoming mere specialties, such as silver fox, chinchilla, Russian sable and broadtail. Mink skins were worth fifty cents each ten or twelve years ago; to-day, they are worth \$6.00 each. Speaking generally, it is safe to say that the price of furs has advanced three hundred per cent

* Fox skins of all kinds. During 1907-9, the world's average yearly production of silver fox skins was only 4,300.—*Ed.*

† Mr. Jones' estimate has a somewhat rosy hue. Nature will inevitably regulate matters by loss of fecundity in captivity, etc. There is every reason to believe that the production will not reach anything like one hundred thousand.—*Ed.*

in fifteen or twenty years. Moreover, the price is still advancing, although this past year has seen a decline in some lines, so that cheaper furs, such as skunk and muskrat, by being dressed and dyed, are to-day becoming staples. Fur dyeing is becoming a distinct industry, although only one firm in Canada is engaged in it.

**Ranch vs.
Wild Stock**

There has been some discussion about the relative value of ranch and wild-bred stock. Both are to be found on Prince Edward Island, and animals are being imported from wherever they can be obtained, whether from away down South or from Russia. The ranch bred stock are animals improved by domestication and killed at exactly the right time. In-breeding may be a serious detriment to the industry in time, but, so far, it has not been an important factor, as many distinct strains are found on Prince Edward Island ranches. Experience, so far, seems to show, that in-breeding results in improved skins, and if, at any time, it becomes desirable to improve the hair structures of the skins, crosses can be made with wild stock. Skins of ranch bred foxes have always brought the highest prices in London. The buyers know them at sight and rank them highest, because they are always perfect, the animals being killed at the proper season and the skins never being torn. Of all the wild skins those from Labrador are the best. Then follow in the order named, those from Alaska, Quebec, Newfoundland, Northern Ontario, Maine, Saskatchewan and Mackenzie. That is the classification placed upon them at the London auction sales.

**Extent of Fur
Trade**

The volume of the fur trade is simply amazing to one who has not studied the question. We have the figures of Brass of Berlin who has been in the business for many years and who for thirty-five years has been collecting fur statistics. He estimates the total production of the world at 360,000,000 marks or \$100,000,000. I have been assured that America alone spends \$100,000,000 a year on manufactured furs. The whole world pays, roughly speaking, for manufactured furs at retail prices, about \$350,000,000 annually. In Australia, the value of pelts is about \$6,000,000, while Africa and South America produce pelts worth about \$2,000,000 a year. Warm countries of course do not produce furs. For Persian lamb—the product of the karakul sheep—America pays wholesale, approximately \$14,000,000.* In America, the pelts as sold in our houses—not the prices the trader gets, but the prices after they come to the wholesale house—amounted to \$24,000,000 a year. Asia and Europe each pay about a similar amount.

* So stated in a bulletin of the U. S. Dept. of Agriculture, but probably a clerical error.

In America, a greater number of muskrat skins are obtained than of any other fur-bearer, except the rabbit, several million skins going on the market yearly. Of other American animals we might mention the skunk, about one and a half million skins of which are sold yearly; the opossum about a million; the mink about six hundred thousand; the raccoon, six hundred thousand; otter, about two hundred thousand; marten, one hundred and twenty thousand; lynx, ninety thousand; beaver, eighty thousand; and fisher, ten thousand.

**Fur-bearers
Suitable for
Farming** At the present time the following fur-bearers might be farmed profitably: Silver foxes and cross foxes, varieties of the red fox—because they are varieties of the common red fox; the marten, which will probably be a more valuable animal than the fox when we know how to breed it; the otter; the fisher, a near relative of the marten, really the pennant marten; the mink and the black skunk. In April, 1914, No. 1 skunk skins were quoted at \$3.00 by the *Fur News Magazine*.

Then, of foreign fur-bearers, there is the Alaska seal, the Bolivian chinchilla and the Russian sable, all of which might be farmed. I know a wealthy gentleman who is collecting data about the sea otter with the hope of raising it. The latter animal lives along the sea-shore and feeds on crustacea. The Russian sable is being farmed in Russia. These animals have often been brought to this country, but I believe they are the Baikal species worth only twenty dollars. We do not get the animals from Yakutsk which, though they are smaller than a mink, are worth \$200 each. The Alaska seal may be said to be under domestic conditions, because, since the Seal Treaty was signed in 1911, the United States Government has had men looking after the seals on the shore, selecting the two-year-olds and allowing them to breed. According to Mr. Geo. A. Clark, of the U.S. Bureau of Fisheries, the fur-seal census of 1912 showed a total of 81,984 pups. This meant an equal number of breeding cows.*

I do not suppose we will ever come to the day when we will breed humming birds, but it is reported by Hornaday that, within the last year, a coat made of humming-bird skins was sold in Paris for \$10,000.

**Karakul Sheep
Industry** I have been asked by the Chairman to describe, to some extent, the karakul sheep industry, and the production of Persian lamb, astrakhan, krimmer, and broadtail furs. I do not desire to say much about this new industry until a larger number of lambs have been produced in Canada, so

* *Science*. N. S. Vol. XXXVI, Dec. 27, 1912.

that more skins could be shown. To-day we have almost all the karakul sheep available outside of Russia, right here in Canada.

I shall endeavour to describe the manner in which it is proposed to conduct this business in Canada. The home of the industry is Bokhara, in West Turkestan. West Turkestan is a Russian dependency two hundred miles north of Afghanistan and eight hundred miles east of the Caspian sea. Russia has little hold on the territory, although it is policed by Cossacks. A railway has been built through Bokhara and new cities established near the old ones, as the latter were very insanitary. It was in this region that the karakul sheep originated. The expression "karakul sheep" does not mean anything more than if one were to say "Canadian sheep," as applied to all the sheep raised in Canada. There are good karakuls and poor karakuls, and I believe that the credit belongs to a Russian American for discovering how good skins are produced. For fifty years, skins have been shipped out and have been distinguished by the names of various districts. Years ago they were called "Astrakhan" because they were brought to Europe through Astrakhan, a district bordering on the Caspian sea. Persians later engaged in the trade, and they called the fur, "Persian lamb." Other names are karakul, krimmer and broadtail. They are all produced by the one breed of sheep or varieties thereof. The natives, owing to the rising prices in furs, have been breeding these sheep in great numbers. They have been crossing fine woolled sheep with the karakul, so that, of late years, the quality has been reduced. I was told by a fur dealer in this city that, a few years ago, at the Nijni-Novgorod fair in Russia, one would find that perhaps as many as ninety per cent of the skins would be No. 1. To-day not thirty per cent would be No. 1, owing to the crossing of fine-wool sheep with the karakul produced in Bokhara. The people there have no more chance of breeding animals properly than our Indians would have. They do not understand the disastrous effects of in-breeding. The Russians, through their agricultural societies, have brought out many of these sheep. Generally, however, the sheep thus obtained were too fine in the wool. If good sheep were secured, the Russian custom of raffling for them, scattered them promiscuously and any benefits that might have resulted from the importation, were largely lost.

**Karakuls in
America**

In 1908, Dr. Young, a Russian American, succeeded, with the help of high officials, including Mr. Roosevelt, in bringing out to America five karakul rams and ten ewes. For three years, these were bred in Texas. In some instances good lambs were obtained and, in other cases, only very

inferior ones. These early American breeders thought that, if they crossed the karakul with any of our sheep, they would get good fur. These experiments were carried on for three years with varying success. Finally, by means of microscopic examination of the skins it was discovered that it was the presence of the fine wool in one or other of the parents that destroyed the fur of the offspring. By carefully selecting sires having straight, stiff, coarse hair, and free from fine wool, it was found possible to produce skins as high-grade as any that come from Bokhara. That has been certified by the United States Department of Agriculture. I am assured by an authority on the subject that the wholesale price of such skins, as listed by Speer of New York, is \$10.00 each, in lots of one hundred and sixty to two hundred. The ordinary lamb, five months old, is worth \$4.00 or less, on an average, as mutton in this country. Here is a skin produced in America (exhibiting skin) taken from a lamb two days old, worth \$12.00 in wholesale lots, produced by a karakul crossed with a Lincoln. The market for these is unlimited. These lambs are generally killed when one week old. Here is one (exhibiting skin) three weeks old. It is noticed that the fur is loosening up. To sell for the highest prices, the lambs must be killed at just the right time.

The first importation of karakuls to America in 1908, consisted almost wholly of fine-wool sheep, because the fatal effect of fine wool on karakul was not then understood. But, with coarse-wool karakuls free from fine wool, the results are sure to be satisfactory. There was one ram in the first importation, "Teddy Senior," whose offspring produced these high-class skins. The offspring of another ram, "Fasset," produced skins of an average value of \$5.00 to \$6.00 each. The others produced only fine-wool lambs, the skins of which sold for \$3.00 or \$4.00 each, and were disposed of, along with four of the ewes, to a dealer in Kansas. Of the ewes, only two were of the coarse-wool variety. These skins, of course, are always dyed, to fix the black colour against the oxidizing action of sunlight. It costs forty-eight cents to prepare and dye a skin.

In a circular letter recently issued by the United States Department of Agriculture there is some very interesting information. During the past two years they have been experimenting with animals supplied by Dr. Young and they arranged to borrow one of the rams to conclude some experiment they were carrying on. This circular letter was issued during the fall of 1913. It is as follows:

KARAKUL, OR ARABI SHEEP

"The numerous enquiries directed to the Department of Agriculture concerning the Persian lamb industry have led to the compilation of the following information.

"Persian lamb skins are the product of the young of the karakul or arabi sheep and not of the Persian breed of sheep. These sheep are natives of Bokhara, in Russian Turkestan, and are not found in Arabia, and only to a small extent in Persia. A number of other terms have been used in connection with the industry, some of these being used interchangeably with Persian lamb. Among these are broadtails, astrakhan and krimmer. The term "broadtail" is applied to skins of lambs of karakul blood and born before the close of the regular gestation period. Astrakhan and krimmer skins are supposed to come from sheep of somewhat different breeding.

"The demand for Persian lamb skins has increased wonderfully during the past fifteen or twenty years and is still expanding. A member of the largest importing firm in America is of the opinion that there is no immediate indication that the supply will exceed the demand. The higher prices paid for skins has led to a great deal of crossing for the purpose of procuring a greater supply of skins, and it is held by some authorities that the very existence of the breed in Bokhara was threatened.

"The skins imported to this country come over in the raw state in bales containing around 100 skins each. They are unsorted and some of them are not worth more than twenty-five cents each, but most of them range in value between \$3.50 and \$15.00. It has been estimated that \$14,000,000.00* are spent abroad annually for skins and this may indeed be possible, for one New York house alone handles from 200,000 to 250,000 skins per season.

"The possibility of establishing the industry in America led to two importations being made in the years 1908 and 1912, respectively. These sheep were brought over by Dr. C. C. Young, of Belen, Texas. The first lot consisted of five rams and twelve ewes and the second of twelve rams and seven ewes. From this stock and its offspring, flocks have been established in Texas, New Mexico, Kansas, Maryland and Prince Edward Island, Canada.

"The karakul is a hardy, broad-tailed, medium sized sheep of considerable length. The rump is characteristically rounded and usually steep. The rams are horned but the ewes are usually hornless. The ears are small and pendulous. The face is narrow and much rounded and together with the legs is covered with short, glossy hair. The body of the adult bears a coarse, long, hair-like wool, varying in colour from light gray to black. The absence of soft under wool is said to be an indication of purity of blood. The mutton of the karakul is said to be of very high quality.

* *Foreign Commerce and Navigation of the United States, 1912*, states that in the year ending June 30, 1912, furs with a total value of \$25,438,834 were imported into the United States. Deducting seal-skins imported, gives a total for all other furs of \$25,000,000. It seems improbable that Persian lamb skins account for 56 per cent of this sum.

"The lambs when dropped are usually a glossy black, but rarely golden brown ones occur. The wool of the lamb is tightly curled over the body and well over the head and down over the legs. The qualities that determine the value of a skin are tightness and size of curl, the lustre, and size of the skin. The lustre is improved by the dyeing process which is essential in preparing the skin for use. The curls rapidly lose character and the lamb should be killed when not older than ten days, though there is much variation in the age at which the skins are of greater value.

"The industry is still in its infancy in America and much is yet to be learned concerning it. Present indications point out a gradual progress and this is most desirable.

"The Department of Agriculture, in its work at the Experimental farm at Beltsville, Maryland, found that the karakul cross upon the American merino was unsatisfactory from a fur standpoint. Results from private flocks confirm this finding. This crossing has extended to include more of the breeds, and indications are that none of the close wool sheep give satisfactory results, especially in the first crosses. What can be developed from higher crosses containing a higher percentage of karakul blood remains to be seen.

"The karakul-barbado cross was also tried at Beltsville. The barbado is called the woolless sheep and the first cross resulted in a failure so far as curl was concerned, although the lustre was all that could be desired. In November, 1913, the skins of eight lambs sired by a karakul ram, and out of first cross karakul-barbado ewes, were sent to New York for valuation. One skin was appraised at fifty cents and one at \$10.00. The average price of the eight skins was \$4.75. The work is being continued and the higher karakul crosses are being produced. If the high fecundity of the barbado can be maintained in these crosses and the fur improved by continually using pure bred karakul sires, this may prove a means of increasing the amount of karakul blood in America. Some Cotswold and Lincoln ewes are now being bred to a karakul ram.

"The method of removal and treatment of the lamb skin should be as follows : Cut a straight line down the belly, and also cut down on the inside of the legs to meet the centre line. Do not cut off any part of the skin, leave on the ears, nose and tail to the tip. Be careful not to make unnecessary cuts. *Stretch* skin evenly on a board, fur side down and dry in a cool place. Do not salt the skin or double it up for shipment purposes. The principal object is to avoid cracking the skins. See that it is properly shaped when nailed down to the board and thoroughly dried before shipping. Do not sun dry the skin.

"The high price of breeding stock is at the present time a deterrent influence upon the industry. Such pure bred rams as are available have sold at from \$500.00 to \$1,000.00 each. Ewes are somewhat cheaper. When buying breeding rams be careful to get pure bred animals. Some breeders claim that as good results can be obtained by the use of half blood stock, but this has not yet been established. It is advisable to buy only such rams as have already demonstrated their ability to sire skins of value."

This shows that there are a great many precautions to be taken in breeding karakul sheep. The presence of fine wool in rams or ewes will produce undesirable results. It is necessary to select coarse-wool sheep, which are very difficult to obtain. To do so, one must first of all obtain a passport from the Russian Government. The people in the interior of Asia where the sheep are obtained, are Mohammedans, who will not sell to a Christian. One has to get the Emir to send out his agent and condemn the property one desires to obtain, and then seize it. The country is infested with numerous, dangerous diseases, caused by the improper disposal of sewage. The Mohammedans have pools in the centres of their towns, where all ablutions are performed, and of course there are many diseases spread from these. The Russians have had to build their cities fifteen or twenty miles away from those of the natives in order to be able to live in the district at all. In addition, one has to be constantly armed and accompanied by Cossacks. Dr. Young has twice imported these sheep into the United States, in contravention of the laws of Russia and Bokhara, which forbid their exportation ; and of the United States, which forbids their importation. In the latter case, special permission was obtained. Concerning the difficulties to be met with Dr. Young described them in a recent article as follows :

“Providing a Russian subject can secure permission from the Russian Department of Agriculture, and the Department of Foreign Affairs gives its consent, and providing further, that his Majesty the Emir, permits him to enter the khanate, it is only a matter of being properly financed and a limited number of karakuls can be obtained. Although after all, the consent of the proper djigit (an official of the district governor, who can do what he pleases with his subjects) is indispensable.

“A foreigner cannot get out karakul sheep for the following reasons :

“1. Even after securing permission from the Russian War Minister to enter West Turkestan (which he will never get without the most active support of his Ambassador) he is not permitted to go to Turkestan, Central Asia, at all, and he can not go to Takta Bazar, Kushk, Kerki, Termez or Karshi, which kishlacks are in the prohibited military zone.

“2. The Emir does not permit a foreigner to export karakul sheep and should he get them into European Russia through a third party, he can not get them out lawfully.

“3. Almost all European countries prohibit the importation of live stock from Asia, on account of certain diseases, and especially is that true of England, United States and Canada. Even where an exception is made, for purely experimental or exhibition reasons, the most rigid quarantine is imposed, lasting for months. Those

foreigners who have travelled in Russia with proper credentials showing them to be interested in scientific research work will testify to the great courtesies shown them by Russian officials, and this explains why we were able to get out a few head of karakuls. On account of the mistakes made by us in our first and second importations, we found after several months' investigation of the sources from whence our sheep come, that some of them might be in-bred. We hope to secure permission to export a few more sheep and select them ourselves in the forbidden zone of Bokhara. Though I was not permitted to enter the forbidden zone of Bokhara and Transcaspia last March, I hope to be able to do so this time, as it is the opinion of the Russian Department of Justice, that, since I became naturalized in America without the permission of the Russian Government, I am still a Russian citizen, who needs but to return with a Russian passport in order to enjoy all the rights of Russian citizenship."

Future of Fur-farming With regard to the future of fur-farming in Canada it seems to me that its value can be greatly enhanced by diversifying it. The domestication of the silver fox is now a complete success. With mink, the problem is about settled. I know parties who have paid twenty dollars (ten per cent of \$200) a pair for mink to be delivered next fall. Marten is a more valuable animal to farm than the mink. We have not yet learned how to do it, but there are many experiments under way, some of which will undoubtedly terminate successfully. One great trouble is to secure the animals. Beaver would hardly pay to raise. They destroy trees which are expensive, and they are only worth about fifteen dollars each. About eighty thousand are taken in Canada every year. Two years ago, it was found necessary to slaughter a large number of them in one of the National parks, and, as a result, the prices came down, I do not think that breeding of the muskrat can be successful for many years to come, unless one has a large natural preserve and protects the animals. In Maryland, an owner of a large marsh allows a man to take muskrat, retaining a half interest in the animals captured. If we can farm four or five kinds of native fur-bearers and, at the same time, introduce valuable exotic species of animals, much will be done to increase the interest in, and add to the value of fur-farming in Canada.

THE CHAIRMAN : I understand that Dr. C. C. Young is in the audience, and I am sure that we would be pleased to have him speak to us, concerning the karakul sheep industry.

PROSPECTS OF THE KARAKUL SHEEP INDUSTRY

DR. YOUNG : Mr. Jones has said a good deal already in favour of the karakul sheep industry, but he has not mentioned the fact

that the experiments that have been made in the past six years have been carried on over the greater part of the United States and a large section of Mexico. The extremes in the climatic conditions between Michigan and Mexico are noteworthy. We do not know absolutely what climate will be best suited to the industry. Central Asia is a country of great climatic extremes. The climate is strictly continental, hot in summer and cold in winter, and, as the natives have neither shelter nor feed, only hardy desert animals can subsist. There is not the slightest doubt that the karakul sheep is an exceedingly hardy animal. In fact, with the exception perhaps of the camel and of the Mexican burro, there is none hardier. Whether or not the climatic conditions will in time affect the tightness of the curl or the lustre of the fur I am not at present able to say. I rather think that it will not.

I have been asked why I selected such a country as Prince Edward Island which differs so greatly from Bokhara. I am frank enough to say that I have done so because one likes to do things along lines of least resistance. I lived in Texas and when one talks about furs there people think one is crazy. Another thing that I have noticed is that the English long-wool sheep are quite common in Prince Edward Island. You know it is necessary to cross the karakul with long-wool and coarse-wool sheep if one desires to obtain satisfactory results in the first cross. I think one can get results from the fine-wool breeds in two crosses, as you will see from the circular of the Department of Agriculture of the United States which has just been read by Mr. Jones. In the experiments for the United States Government a fine-wool strain was used, and that is why the first cross was not satisfactory. But in the second cross, the larger amount of fine wool blood of the sheep, which had this fine wool admixture, having been bred out, they produced skins worth \$10.00. So it will be seen that it is not essential that the fine-wool sheep be absolutely eliminated. That is not the case; it is only where you desire results in the first cross that the long-wool sheep is necessary. The long-wool sheep does not do well in the South-west. It demands a climate something like the climate of the Northern States, and, when I observed a tendency on the part of long-wool sheep on Prince Edward Island to coarser wool formation, I thought that a great point in my favour. Another thing, I notice a remarkable lustre in the wool produced in Prince Edward Island, more than I have seen in that grown in other sections. However, I suppose the climatic conditions do not vary at all from the other eastern Maritime provinces.

The difficulty in getting the animals out to Canada is a serious one, and one must not think that Asiatic Russia is the only country that one cannot travel in safely. One cannot go into Afghanistan at all. Ambassador Reid, who tried to effect a passage for me, had to give it up. The English Government could not make it possible for any one to cross that country.

Another problem concerning which there is doubt, is that of pigment in the skins of these sheep. I have been told that there is no such thing as a quarter-blood animal (quadroon); that animals are either full-blood or half-blood. I do not believe a word of that, although that opinion has been expressed to me by scientific men. I know the great difference there is, as the result of the dominance of certain pigments. I know that black pigment is always dominant over red, until the black is gradually diluted. This accounts for the quarter-blood being black, where you cross red sheep, like the Persian fat-rump, as the report of the Department of Agriculture at Washington stated. When I told the officials of that Department of the crossing with barbado, they claimed that the half-bloods would be red; that when crossing the same sheep with merino, even in quarter-blood, the red pigment would still be there. The lambs born during the coming spring will clear up the doubt on this point. I have predicted that the quarter-bloods will also be black, so strong is the black pigment. The half-blood is black and the quarter-blood is black, but in the octoroon, the black pigments come out. In the third cross one sees the red pigment looming up. In the crossing of quarter-bloods with a white, the chance of getting a gray fur is great, although most of the lambs are born spotted. So there is a great difference in this dominance of pigments, and I know from experience that the chance of getting a black offspring from a quarter-blood karakul lamb is infinitely better than from a half-blood. If there are no quadroons or octoroons, there are only full-bloods and half-bloods, I have some doubts about the fact and I desire to make this statement, that there is absolutely no necessity for using full-blood karakul sheep for the production of Persian lamb. The average Persian lamb skin, as found on the market, does not contain over twenty-five per cent of karakul blood, and, on going to Bokhara, we find the reason is that there are very few karakuls left. One may see four thousand or five thousand sheep with very few karakul rams among them. It is this black pigment that does the work, and it has been my good fortune to discover the reason for this action of the pigment.

Students of the subject have ascertained that the karakul sheep originated in Arabia. When I reached Bokhara, I began to study

this matter of the crossing of breeds, and I met the representative of the Dalai Lama of Thibet on his way to study it also. He gave me a great deal of information, and I learned that fifty-nine years ago there were no karakul sheep, there were no sheep in Central Asia except the long-tailed, black danadar animal which came from Afghanistan and from which the merino springs. As the demand for skins increased the people of Central Asia began to cross with other breeds. The first result of this crossing was the gray danadar which was the same as the little karakul. Later the large karakul was developed, the result of a cross between the black danadar and the red sheep. I had the good fortune, through the courtesy of Prof. Wallace of the University of Edinburgh, to see the furrier in London who sold the last danadar skin fifty-nine years ago, and he confirmed the statement that I have just made that then there was no such thing as a Persian lamb or a karakul.

Prof. Wallace, after a great deal of difficulty, obtained permission to import a karakul ram into Great Britain, and he is now experimenting with twelve different breeds of sheep. I think I can tell him with mathematical exactness what the result will be. The fine wool breeds will produce poor results in the first year. In the case of the coarse-wool one cannot tell any difference except that the coarser the wool in the sheep the tighter the curl and the more expensive the skin. The finer the texture in the long-wool the more tendency there will be for the curl to open up. There is a great deal of horny substance required in order to give the tight curl, but one can have too much of it, one can have a sheep whose wool is so brittle, so rich with horny substance that one may get a straight skin. I think that is what the American mountain sheep would give us with the barbado. I am convinced that it is not necessary to kill the full-bloods to get Persian lamb skins. The proper system is to use the full-bloods to produce breeding animals and use grades to produce the furs. One cannot tell the difference between the full-bloods, the half-bloods and the quarter-bloods except that the grades in this country have infinitely more lustre than in Asia, because there are no long-wool sheep in Asia, and if the long-wool had only the curl we could add the pigment by dyeing the skins.

THE CHAIRMAN (Mr. Sifton) : I know we are much interested in this discussion of fur-farming. We know what is said about the man who makes two blades grow where there was one before. These gentlemen have made fur grow where there was none before and it has been very interesting indeed to hear their account of how it is done.

DR. HOWARD MURRAY: There is a matter to which I desire to refer at this time. We have all learned with pleasure that Dr. Frank D. Adams, Dean, Faculty of Applied Science, McGill University, has been added to the members of the Commission. Dr. Adams' wide knowledge of minerals and mining conditions in Canada, fit him admirably for work such as our Commission is attempting to do. As the chairmanship of the Committee on Minerals is vacant, I have great pleasure in moving that Dr. Adams be appointed thereto.

Motion agreed to.

The general meeting then adjourned.

Committee Meetings

At the close of the afternoon session on Tuesday, the Commission resolved itself into meetings of its several Committees, for the more detailed discussion of conservation matters, for the purpose of formulating plans for future work, and for the drafting of resolutions for presentation to the whole Commission for its approval. Brief accounts of these meetings follow :

Committee on Public Health The meeting of the Committee was called to order by Sir Edmund Osler. Those present included Dr. C. C. Jones, Hon. H. S. Béland, and Dr. C. A. Hodgetts. The work covered during 1913 was discussed in detail. The members felt that it was particularly urgent that the resolutions passed by the Public Health Conference of 1910, and subsequently approved by the Commission, should be again placed before the Right Honourable, the Prime Minister. These resolutions were concerned with the establishment of a Dominion Department of Health, and the establishment of Federal laboratories for the manufacture of biological products.

*** Committee on Minerals** Owing to the fact that the Chairman of the Committee on Minerals had only just been appointed, it was considered that sufficient time had not been afforded for a careful consideration of the questions, which naturally fall within the province of this Committee. As a consequence, therefore, no resolutions were prepared. Those who attended the Committee meeting were : Dr. Frank D. Adams, Chairman ; Mgr. C. P. Choquette ; Dr. Howard Murray and Mr. W. J. Dick.

* Up till the time of going to press the Committee on Minerals had not held a meeting, and, therefore, the recommendations respecting the work of that Committee are still under consideration.

**Committee on
Fisheries and
Game**

This Committee was convened by the Chairman, Dr. C. C. Jones, and the following members were present during the meeting : Premier J. A. Mathieson, Hon. A. E. Arsenault, Dr. Howard Murray and Dr. J. W. Robertson. Much of the discussion was concerned with the work of the Fisheries Protective Service and the desirability of improving the organization with respect thereto. The question of providing instruction for fishermen, as is done for farmers, was likewise given much consideration.

**Committee on
Lands**

Dr. James W. Robertson, Chairman, presided at the meeting of this Committee. Those who attended were : Mgr. C. P. Choquette, Dr. C. C. Jones, Mr. John Fixter and Mr. Chas. Murray. The work of the agricultural survey was discussed informally and plans for its continuance were made.

**Committee on
Forests**

This Committee met under the chairmanship of Senator W. C. Edwards, and others present were : Mr. W. B. Snowball, Dr. B. E. Fernow and Mr. Clyde Leavitt. Lengthy discussions took place as to ways and means for completing the reconnaissance work undertaken in Western Canada. Fitting reference was also made to the death of Mr. Frank Davison, who was, in former years, a faithful attendant at all the meetings of the Committee.

**Committee on
Water-powers**

Under the chairmanship of Hon. H. S. Béland, the Committee on Water-powers discussed a number of questions relative to the proper appraisal of the water-power resources of Canada. It was felt that much data should be brought together, especially in regard to boundary waters, that would be of great service, not only to legislators, but to those interested in power development. Those who attended the meeting were, in addition to the Chairman, Mr. C. A. McCool and Mr. A. V. White.

Wednesday Morning Session

The morning session opened at 10 o'clock with the Chairman, Hon. Clifford Sifton, presiding.

THE CHAIRMAN : We shall first have a paper by Mr. Leo. G. Denis on the work of the Committee on Water-powers, especially with regard to the reconnaissance survey of water-powers in the Prairie Provinces.

REPORT OF THE HYDRO-ELECTRIC ENGINEER

MR. DENIS said :

In January, 1913, I attended a conference of the district engineers of the United States Water Resources Branch, held in Washington,



"OVER THE HILL RAPIDS," UPPER CHUTE ON THE NELSON RIVER, MAN.



KETTLE RAPIDS, NELSON RIVER, FROM THE PROPOSED CROSSING OF
HUDSON BAY RAILWAY

D.C. Valuable information respecting the methods pursued in collecting water-power data was obtained and I was much impressed by the great importance given to the subject of systematic stream flow observations. In this connection, it might be stated that your Committee has long been urging that more attention be paid to this subject in Canada, and it is only fair to note that considerable progress has been made in certain portions of the Dominion.

**Stream-flow
Investigations**

In British Columbia a great deal of attention is being given to stream flow, both by the Water-powers Branch of the Department of the Interior and by the Provincial Department of Lands. In Alberta and Saskatchewan, the Forestry Branch of the Department of the Interior has 132 stream-gauging stations in operation, and is adding to this number from year to year. Regular yearly reports are published giving full details of gaugings at each station and other information of interest relating to the work. In Manitoba, the Water-Powers Branch of the Department of the Interior has several gauging stations on the Winnipeg and on numerous other rivers throughout the province. Regular observations are taken at these stations and, although the information has not yet been published, it will prove of great interest as soon as it is available.

In Ontario more and more attention is being given to stream flow and, in the last report of the Hydro-Electric Power Commission, it is stated that seventeen rivers were under observation and that monthly measurements of flow were being made at one or more points on these rivers. It also contains information on stream flow throughout the province. The Ottawa River Storage Branch of the Department of Public Works is continuing its excellent work on stream flow observations on the Ottawa river and its numerous tributaries. It is to be hoped that all the provinces will give more attention to this very important study and that data respecting all the principal streams will thus be made available.

On the recommendation of Mr. J. B. Challies, Hon. W. J. Roche has supplied the Commission with a detailed report of the work of the Water-powers Branch in southern Manitoba which will be included in the forthcoming report on the water-powers of Western Canada.

In addition to the report by Mr. J. B. Challies, much information has been gleaned from departmental reports and other sources, respecting rivers in the Prairie Provinces. This compilation is now in fairly good shape and ready to insert in the forthcoming report.

In June, I attended the annual convention of the Canadian Electrical Association held in Toronto. Important discussions took

place at this convention on the latest developments in electrical engineering.

**Power Survey
in Manitoba**

In order to obtain additional data for the report on the water-powers of Western Canada, a reconnaissance survey was made of some of the rivers of northern Manitoba. I left Ottawa for Winnipeg on July 9th, and reached the latter place on July 11th. Here I obtained information and letters of credit and of introduction from the Hudson's Bay Co. I also obtained data respecting levels of the Nelson river from Mr. Armstrong, chief engineer of the Hudson Bay railway. On July 15th, I left Winnipeg for Selkirk, whence I sailed for Norway House on the same day. I arrived at Norway House on July 17th. As it was near the date of payment to the Indians of their treaty money, trouble was experienced in obtaining men for the trip down the Hayes and up the Nelson. Leaving Norway House by canoe on July 23rd, the Nelson, Etchimamish and Hayes rivers were followed and Oxford Lake post was reached on July 29th. At this point the guide fell ill and could not proceed any farther. After a delay in securing a new guide, the journey was continued down the Hayes river, and, after delays due to wind and rain, York Factory, at the mouth of the Hayes, was reached on August 7th. From this point it was proposed to ascend the Nelson river, but, as the Norway House Indians did not know the lower portion of this river, two York Factory Indians were engaged to accompany us as far as Split lake. Leaving York Factory on August 11th, we reached Split Lake post on the 19th, this portion of the Nelson presenting unusual difficulties to canoe travel. Leaving Split lake on the 21st, we arrived at Norway House on the 29th and left Warren Landing by steamer on September 2nd.

The next objective point was the Berens river, but, as the steamer navigating lake Winnipeg does not stop there regularly, we only reached this point on September 7th. At Berens River post, men were engaged and on September 9th, the ascent of the river by canoe was begun. Little Grand Rapid post was reached on the 14th. The return journey was made by way of Pigeon river, leaving Little Grand Rapid post on the 15th and reaching Berens River post on September 20th. The greater portion of Pigeon river is seldom travelled, even by Indians, and some of the portages are very rough and difficult. After some delay at Berens River post waiting for a steamer, the mouth of Dauphin river was reached on September 24th. Here, men were secured and we ascended Dauphin river to lake St. Martin, thence by waggon to Fairford and by train to Winnipeg, arriving September 30th. To obtain information re-



TROUT FALL, HAYES RIVER, NORTHERN MAN.



UPPER DRUM RAPID, HAYES RIVER, NORTHERN MAN.

specting hydro-electric plants either projected or in actual operation, Brandon, Minnedosa, Birtle and Neepawa were visited. Returning to Winnipeg on October 4th, I arrived at Ottawa on the 7th.

To obtain a general idea of the water-power possibilities of the rivers inspected a brief description of these will be of interest.

Water-powers of In considering this river from a water-power stand-
Hayes River point, it may be divided into three sections :

1. From Hudson bay to the mouth of Fox river ;
2. From the mouth of Fox river to "The Rock," and
3. Above "The Rock."

In the first section, which extends some 90 miles above its mouth, the Hayes is quite wide and the current much slower than in the second section ; low banks are quite frequent and power development in this section is practically impossible.

The second section—from the Fox to "The Rock"—is the best portion of the river for power development, although, in each case, heads would have to be created by dams. This section is some 35 miles in length and the total descent observed by aneroid is 285 feet or an average of over eight feet per mile. The river has a fairly uniform width of about 250 feet ; the banks, with few exceptions, are quite high and heads of thirty to forty feet could easily be created, though the selection of the dam sites would have to be based upon careful surveys. At four, seven, twenty and twenty-three miles below "The Rock," there are stretches of rough waters or small rapids ; each is from one-quarter to one-half mile long with descents of three to four feet. Probably good dam sites could be found near the points where these occur.

The third section—above "The Rock"—is about 190 miles long, but over three-quarters of it is made up of lakes. The connecting streams between the lakes are short and the descent in them comparatively steep. Unfortunately, these descents, with few exceptions, do not aggregate ten feet and, as the banks are generally low, their concentration, in many cases, is not feasible.

The discharge of the Hayes river, metered on August 5th, 1913, at a point four miles below "The Rock" was 3,265 cubic feet per second. The width of the river at this point is 252 feet, the maximum depth 7 feet, and the greatest mean velocity in any one section, 3.45 feet per second.

Water-powers of In considering the character of its rapids and falls,
Nelson River the Nelson may be divided into three portions :

1. From the mouth to Kettle rapid.
2. From Kettle rapid to Split lake.
3. Above Split lake.

In the lower section—below Kettle rapid—the river is generally very wide, and free from islands where the rapids occur. The rapids have a very gradual descent, are quite long, and, on account of the great width of the river, power development is not very attractive.

In the second section—between Split lake and the foot of Kettle rapid—there are generally numerous islands in the rapids. The rapids have steeper descents and, although in some places the banks are rather low, this portion of the river presents greater possibilities than the lower.

In the two stretches just described—which include the river below Split lake—there is practically a continuous series of rapids and swifts. Even between rapids there are no stillwaters, these stretches being either swift or rough.

Above Split lake—the third and uppermost section—the rapids and falls are well defined and their descents are generally quite steep, particularly as compared with the river below. In this portion, except above Pipestone lake, the stretches between the falls or rapids are almost stillwaters, and the total descent in the river is practically concentrated in the chutes and rapids. In many cases the chutes and rapids, particularly above Sipiwesk lake, occur in several narrow channels separated by islands; where these islands occur the river, from main bank to main bank, is quite wide, but the individual channels between islands are narrow. Development in this portion of the river could be easily accomplished. In the case of the higher falls, say those over eight or ten feet, there is no doubt that the total head could be utilized, while the chutes and rapids with less descent, could possibly be combined or used to increase the head at the higher falls.

**Water-powers of
Berens River** The Berens river has numerous concentrated falls or rapids, the descent in each, however, not being very great. The greatest is at Night-owl rapid, which has a fall of 39.0 feet. Little Grand rapid has a descent of 21.2 feet. There are six rapids with descents between ten and fifteen feet, ten with descents between five and ten feet, and no less than thirty with descents of less than five feet. Many of these could be combined to obtain a head of water which it would be worth while to develop. The discharge of the Berens river, metered at a point two miles above the "First" rapid, was 1,744 second feet on September 10th, 1913. The discharge of the Etomami, a small river



HIGH CHUTE, PIGEON RIVER, MANITOBA



ONE OF THE CHANNELS, LITTLE GRAND RAPIDS, BERENS RIVER, MAN.

paralleling the Berens and emptying into it, was, at a point just above its mouth, 234 second feet on September 9th, 1913.

**Water-powers of
Pigeon River**

The character of Pigeon river is very similar to that of the Berens. Both these rivers flow out of Little Grand Rapid lake, and, after following practically parallel courses, empty into lake Winnipeg a few miles from each other. The greatest descent on the Pigeon river is 29.1 feet at Shining fall. There are four rapids or falls with descents between ten and fifteen feet, fourteen with descents between five and ten feet, and thirty-three with descents of less than five feet. As is the case with the Berens river, many of the falls and rapids on the Pigeon river can be combined to obtain workable heads. The discharge of this river, metered at a point three-quarters of a mile below the "First " rapid, was 2,629 second feet on September 19th, 1913.

**Water-powers of
Dauphin River**

This river has quite a strong current throughout its whole length from lake St. Martin to lake Winnipeg, but the banks are very low, with the exception of a portion near its mouth, where they are higher, and the descent in the river more concentrated. This is practically the only point where power could be developed and a head of some fifteen feet could be created by a dam. The low-water discharge of this river during the open water season is about 5,000 second feet.

**Report on
Water-works**

In connection with the report on the Water-works of Canada, it was felt that additional information on the subject of sewage disposal could and should be obtained. Accordingly, circular letters respecting this additional information have been sent to all incorporated municipalities and the data thus obtained has been inserted in the last table of the report now published, making it as complete as possible.

Since my return from the Manitoba trip, circular letters have been sent out to obtain additional information which is to be included in a second edition of "Waterworks of Canada." A few figures revealed by the preliminary circular letters might be of interest, as they show the rapid increase in the number of water-works systems and the importance this subject is assuming in Canada. The first edition of our report, compiled in 1912, described 348 systems, while since then 191 additional ones have come into existence. Of the new systems, Nova Scotia has four, New Brunswick four, Quebec eighty-eight, Ontario twenty-two, Manitoba six, Saskatchewan seventeen, Alberta twenty-two, and British Columbia twenty-eight. The relatively large increases shown in Quebec and British

Columbia are probably due to the fact that a few of the systems included in the eighty-eight and twenty-eight, respectively, were possibly in existence at the time the first edition was published, but that we were misinformed by our correspondents respecting them.

THE CHAIRMAN : We shall now have a report by Mr. Arthur V. White on water-power surveys in British Columbia.

BRITISH COLUMBIA WATER-POWER INVESTIGATION

MR. A. V. WHITE :

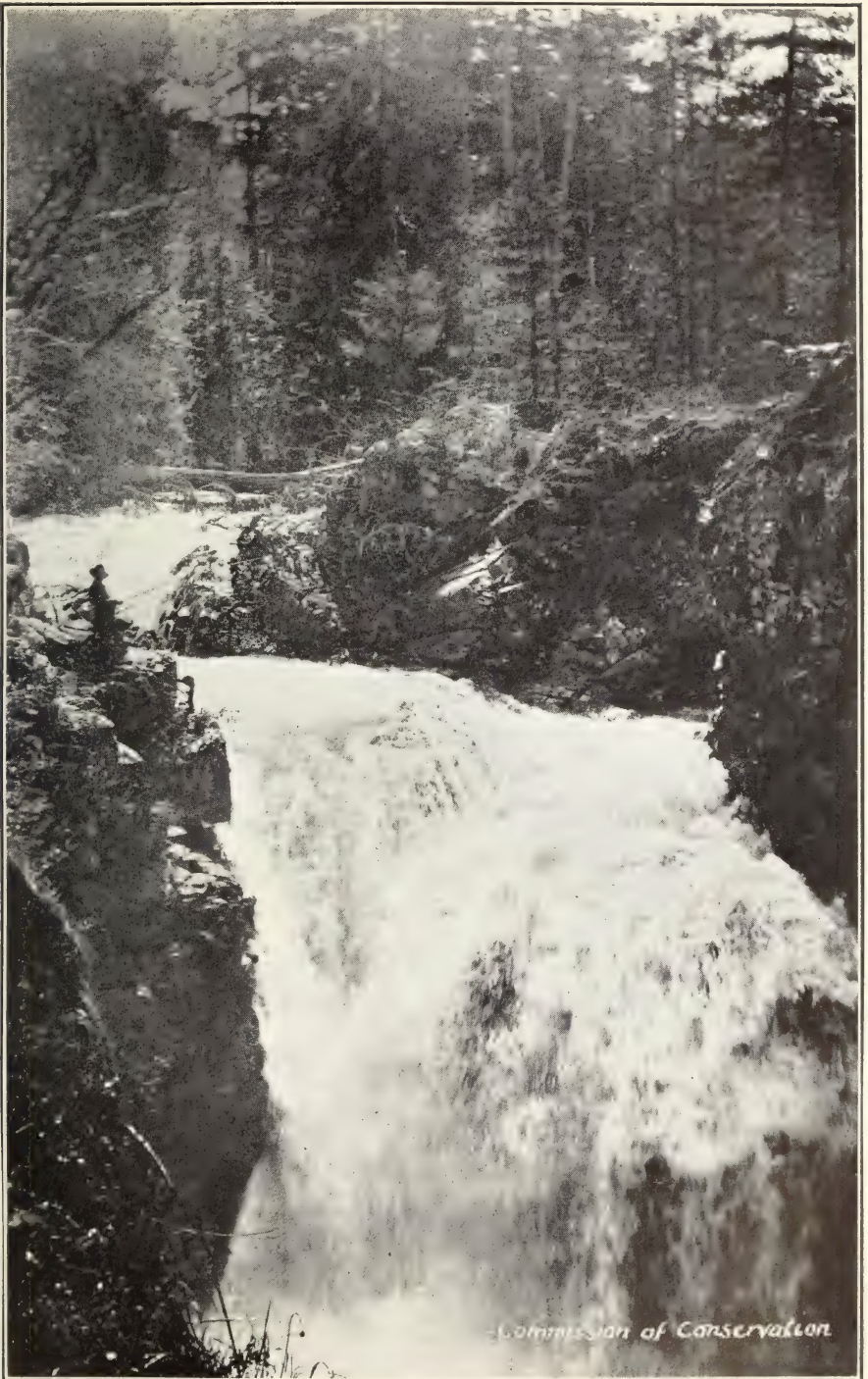
The Water-power investigations in British Columbia have been undertaken to enable the Commission of Conservation to publish a comprehensive report respecting the water-power possibilities of that province.

To understand the present status of the work it is necessary to refer briefly to some matters touched upon in earlier reports.

When the Commission commenced to assemble information relating to the natural resources of Canada, it was perceived that no data existed upon which to base any adequate estimate of Canada's water-powers. The Report on the "Water Powers of Canada," issued in 1911, emphasized the fact that it would be impossible to do justice to the water-powers of British Columbia without making more extensive investigations than were required in the Eastern Provinces; and that these investigations demanded special provisions and considerable time. In this report the Commission promised to conduct a special investigation in British Columbia.

In the British Columbia "Year Book," 1911, it is stated, that : "speaking generally, there is no subject of economic interest in connection with the exploitation of the provincial resources concerning which there is less known than the extent to which water-powers may be rendered available."

When our work was commenced in the summer of 1911, it was concluded best to cover the Province systematically. As the Railway Belt and area south of it, contain the bulk of the population of the Province and comprise many water-power possibilities which are of more immediate economic importance, it was decided to commence in the Kootenays. The initial efforts in East Kootenay soon demonstrated that the rate of progress would be much slower than had been anticipated, and, also, that the money available would not permit of operations as extensive as were desired. However, the Commission has made its largest individual field appropriation for this British Columbia work.



Commission of Conservation

FALLS ON LITTLE QUALICUM RIVER, VANCOUVER ISLAND

Provincial
Co-operation

Upon the commencement of the work the Premier, Sir Richard McBride, and the Minister of Lands, Hon. W. R. Ross stated that the objects of the proposed investigation commended themselves, and that, so far as possible, the Provincial Government would render every possible assistance.

As the field experiences of 1911 had demonstrated that the available funds would not permit covering the Province as rapidly as desired, the Minister of Lands, to expedite the work, arranged for suitable financial assistance.

The funds provided by the Minister enabled additional engineers to be placed in the field, and permitted the despatching of parties up the mainland coast, beginning just north of Powell river.

Even with the increased appropriations made available in 1912, we were not able to undertake all the work planned, and, in 1913, increased appropriations were provided both by the Commission and by the Provincial Department of Lands.

The Hon. W. R. Ross expressed the belief that, if efforts were made to arouse more general appreciation of the importance and value of the provincial waters, more intelligent co-operation on the part of the surveyors, engineers, fire wardens, game wardens, road superintendents, timber cruisers, and others, might be secured in assisting to assemble certain preliminary data respecting water-powers. It was decided, therefore, to issue forms to surveyors, timber cruisers, and others. The information that has come in on the forms has not amounted to as much as was hoped, but more is expected. It seems clear that the chief reason for this paucity is that most persons whose work requires them to go into the less travelled portions of the Province, usually have more than sufficient to engage their attention upon their own work ; and, while no doubt willing to assist in other ways, yet the time and opportunity are not easily created in which to render any special outside services. However, data, which has justified these efforts, are being secured.

In 1912, the suggestion of the Minister of Lands was further acted upon and a small manual, entitled "Instructions Relating to the Gathering of Certain Preliminary Information Respecting Water Powers," was issued. It includes a brief statement setting forth some requirements respecting the gathering in the field of certain data appertaining to water resources, and is designed to be a guide to persons who may aid upon such work.

**Co-operation of
Branches**

Besides the financial assistance rendered, the Commission has received many favours from several of the Branches, both of the Federal and Provincial Governments.

The water situation, as it exists to-day in British Columbia, is more complex than in any other province in Canada. In the early "fifties," water rights and privileges for mining operations began to be taken up, and, subsequently, other rights and privileges were granted for irrigation of large agricultural areas. All these rights are now represented by upwards of six thousand water records, issued under various terms and conditions, and old records are still being discovered. In addition, there are others, given later, for water-powers. Applications for waters for all purposes are on the increase. Great as are the problems arising out of the adjudication of these many conflicting interests, the Provincial Government is making very substantial headway in adjusting the difficulties connected with them. These records constitute the underlying basis of the water situation, and, in many cases, they conflict with the possible development of power on the streams to which they appertain.

In 1912, through the courtesy of Acting Comptroller J. F. Armstrong, provision was made for the compilation of a tabular synopsis of all records and water reservations. Though this synopsis has practically been completed, batches of new records have, from time to time, been discovered, but they can readily be added to the lists already made. This compilation was made by Mr. A. Patton, under the direction of the Chief Clerk, Mr. C. A. Pope.

In 1913, Mr. G. H. Dawson, the Surveyor-General of the Province, again instructed the surveyors employed on provincial land surveys, to send in on special forms, information relating to water-powers. His efforts have resulted in furnishing some data about hitherto unknown power sites. The chief geographer, Mr. G. G. Aitken, has also very kindly assisted us with maps, blue prints, and with advance copies of the new map of southern Vancouver Island.

Mr. D. P. Roberts, Superintendent of the Electric Energy Inspection Branch of the Attorney-General's Department, has kindly furnished information respecting the hydro-electric installations in the province. These data will be reduced to tabular form.

In 1912, the British Columbia Forest Branch had just organized an extensive, systematic survey of the forests of the Province, and the chief forester, Mr. H. R. McMillan, arranged to have the men engaged upon the survey of the forests, report upon water-powers observed. Mr. H. K. Robinson, who has charge of this field work, states that as yet, very little information has come in, but as he did



CASCADE ON TOMLINSON CREEK, TOBA RIVER, B. C.
Characteristic of many streams on the mainland Pacific Coast.

not in November, expect the field reports before January, hopes are still entertained for results from this source.

In 1911, the Water-powers Branch of the Department of the Interior, under the direction of Mr. J. B. Challies, were investigating the water-powers of the Railway Belt, by a hydrographic office, under the charge of Mr. P. A. Carson, that had been established at Kamloops. Mr. Challies kindly arranged that this office should undertake the work of investigating the water-powers in the Belt, and of supplying to the Commission the stream flow records and other hydrographic data for this district. This information, when completed, will be of much assistance.

In 1912, the Department of Public Works, Canada, commenced an instrumental survey of the Columbia river around the 'Big Bend.' Through the courtesy of the Department and the District Engineer, Mr. F. W. Aylmer, it was arranged that we could attach a man to this survey party that he might make water-power investigations of the Columbia and its tributaries, using the main survey party as a base for operations. By request, this privilege was placed at the disposal of the engineer who was then in charge of the water-power work for the Province. It is hoped that another opportunity may be afforded for further examination of this 'Big Bend' country.

Mr. Aylmer has furnished some data resulting from an instrumental survey, made under his direction, by Mr. W. F. Richardson, of part of the 'Big Bend.'

Some hydrographic records have also been supplied by the courtesy of the Public Works District Engineer, Mr. C. C. Worsfold, New Westminster.

Proposed Fraser River Survey On account of the importance of the Fraser and Thompson rivers, the Commission has, for some time past, desired to have a profile survey made of these rivers from tide-water to Shuswap lake. This matter, however, has not yet been definitely decided. The possibility of securing co-operation from the Canadian Pacific railway was taken up with Mr. H. Rindal, District Engineer at Vancouver. He thought he could secure engineers, and the Chief Engineer, Mr. J. Sullivan, stated that transportation facilities could be provided for them, the Commission paying the salaries and subsistence of the men.

Captain Gore, Superintendent of the Canadian Pacific railway British Columbia Lake and River service, has, for some years, supplied copies of records taken during the navigation season on gauges which are read by the officers of the steamboats.

In the United States, there is an increasing tendency to do preliminary work of investigation of water-power streams in a more detailed manner ; the streams are profiled, and possible dam sites, and storage reservoirs, are contoured. This results—without undue increase of cost—in the production of permanent survey records of enhanced value. Vancouver Island presents an excellent opportunity for commencing such an investigation of its rivers.

In 1912, it was suggested that, co-operatively with the Province, we might undertake some surveys of this character, but, after full consideration, the officers of the Commission decided that it involved work of a more special character than is deemed to be within the province of the Commission's aims. In addition, when the season's work was well under way it was evident that there would not be sufficient time or money for these special surveys.

Co-operation of U. S. Geological Survey A day was spent in Tacoma with Mr. R. L. Parker, District Engineer, Waters Branch, U. S. Geological Survey, who has supplied valuable information respecting the Skagit, Similkameen, Okanagan, and other streams which flow into the state of Washington from British Columbia. Mr. W. A. Lambe, District Engineer, U.S. Geological Survey, Helena, Montana, has also supplied corresponding information dealing with streams like the Flathead, Pend d'Oreille (Clark fork), and Kootenay. This assistance is very much appreciated as it will enable us to include in our report valuable data, not otherwise available.

Objects of Field Work One of the chief objects of the power investigation is to determine the location of possible power sites, indicate their possible development, and, also, to give publicity to such information. In this way, knowledge of the water-power possibilities of British Columbia will be communicated to other parts of Canada, and to other countries.

The results will be presented in tabular form, giving the name of the stream ; the local name, if any, of the fall or rapid ; the area of each watershed* ; the height of the respective falls or rapids ; remarks upon the character of the banks, etc., and an estimate of the possible amount of power.

In reducing the field data so as to make it represent the water-power possibilities, it has been the custom of the officers of the Commission not to make any deductions of power possibilities until just before the report is ready for publication. This is because it is

* In many instances the areas, especially for the smaller streams, can only be approximations.

necessary to secure all, even fragments, of reliable hydrographic information, and such data is, at best, quite meagre. For this reason, no tables of estimated horse-power have yet been extended for any of the years during which the Commission has been making investigations in British Columbia. It may yet be a few months before this portion of the work is completed, and even then, in the majority of instances, it will be a troublesome and more or less unsatisfactory task, as compared with what it would be were more hydrographic data available.

Suggestions re Gauges Wherever possible and desirable, good permanent gauges to indicate the stages of streams and lakes should be installed.

Some gauges have already been established by the British Columbia Waters Branch, by the Water Power Branch at Kamloops, by the Canadian Pacific railway, by the Federal Department of Public Works, and also by others.

Good permanent gauges, properly referenced, should exist at such places as : the Government wharf at Chase, bridge at Revelstoke, on Deer rock below Barton, Government wharf at Nakusp, Little Deer river (on the vertical rock), on wharf at Golden, new wharf at Sicamous, new Provincial bridge at Kamloops, wharf at Queens Bay, wharf at Harrop, on Kamloops lake at Tranquille, new bridge at Trail, Canadian Northern bridge across North Thompson above Kamloops, on Spillimacheen below Galena (new bridge Upper Columbia) and on bridge at Athelmere (Upper Columbia).

While these gauge locations, actual and suggested, are in the more southerly portion of the Province, yet they are here mentioned as indicative of typical places where gauges should be installed. All the important rivers and lakes tributary to places like Fort George, Fraser Lake district, Quesnel, Hazelton, etc., should have gauges carefully established and provision made for securing continuity of records. Of course in all cases the zeros should be accurately tied in with *permanent* bench marks.

There are a number of instances where systematic gauge readings have been taken, but where, owing to the fact that the gauges have not been properly referenced to permanent bench marks, and have been washed out, or otherwise disturbed, from time to time, the records have not the reliable continuity which is necessary to ensure their best serviceability. Certain gauges on the Campbell river may be cited. Some of these have been disturbed, and it is doubtful if the new gauges have always replaced the former ones so as to read to the same datum.

The investigating parties established some bench marks and to them, by levels, respectively referenced various gauges.

Whenever engineers who are investigating the waters establish good permanent bench marks, either by a 'crow's foot' cut in the rock, or copper plug sunk in the rock and fastened with cement, or otherwise, and carefully note and record the mark, they render a permanent service.

General Description of Work	The season during which it is profitable to carry on such reconnaissance water-power investigations as we have been making in British Columbia is comparatively short. One of the chief difficulties encountered is that it seems almost impossible for observers to avoid recording in their notes comments which tend to over-represent the power possibilities of streams observed during high stages. Young engineers are impressed with the quantity of water coming down the rivers and have not the advantage of having observed the same streams at their low winter stages, nor have they the knowledge of measurements of the flow of such streams by which to regulate their judgment. Engineers engaged on similar work in the United States, state that they experience the same difficulty. We have endeavoured, so far as possible, to do the work when the streams are neither approaching, nor at their flood stages. This fact is mentioned because it indicates why the time, during which these special investigations may profitably be pursued, is so limited.
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The conditions affecting powers in this Province are unique, and do not closely correspond to those existent in other portions of Canada. This is especially true of the north mainland coast, and also in the 'dry belt.' One cannot but be impressed with the fact that coastal water-powers in British Columbia, which, to the casual observer, may appear to be of comparatively small potentiality, yet when economically and fully developed, as some have been and are being developed by companies operating in British Columbia, are nevertheless capable of yielding several-fold the power they would according to any appraisalment which would apply to streams in Eastern Canada. The fact that glaciers, melting snow and heavy rainfall abound, and that many storage possibilities, known and unknown, exist, constitute unique factors, which contribute to enhance the values of these powers. These conditions, on the other hand, require special and very careful engineering investigation and expert handling, a fact which must not be forgotten if economical results are to be secured.

Before starting up any river, all information possible respecting falls, rapids, cañons, trails, etc., is gathered from local sources. Though much of such information is indifferent and often misleading in character, nevertheless, some valuable information frequently results from such enquiries.

Next, the best method of ascending the stream is decided, and an estimate made of the time necessary for the trip. In the case of the larger streams, a small gasoline boat has been used for portions of the river, but more frequently the canoe. The men have often expressed the belief that a small power canoe capable of making eight or ten miles an hour would have been very useful. Travelling light, it is possible to cover at least twice the distance that can be done with packs. In the case of the shorter streams requiring, say, three days for examination, packs are taken for one day and a camp made for two nights, the intermediate day being spent in travelling up the river light. Without trails, as is so often the case, progress is very slow, and it is worth noting that, where possible power sites exist at rapids or in cañons, the river bed generally is very rough travelling, and the trail is nearly always well away from the river. Thus considerable time is consumed in getting from the trail to the river and back.

In taking individual elevations, the hand level and tape line have been used wherever possible. However, it has been necessary, in most instances, to use the aneroid barometer, especially on rivers with rapid rise, or those coursing through deep cañons where it is impracticable to proceed along the river bed. We used a five-inch instrument reading *on the vernier* to single feet. Where the aneroid has been used it has been the custom to leave one aneroid at sea level on the boat, having it read every hour during the days when the parties were absent. These readings were then plotted to show the variation at sea level and, on the same sheets, the river elevations were also plotted, the time being carefully noted. Wherever possible two readings were taken at the same place, either by two aneroids, or else by a second reading on the return trip.

Difficulties of Travel

The summer of 1913 was considered a wet one even for the northern coast. This made the prosecution of the work more difficult than usual, especially as the precipitation caused high stages in the rivers during the earlier part of the season. However, it was realized at the commencement of the work that efforts would have to be continued, more or less, irrespective of the weather, and on the coast party not one day was lost because of rain, although for three weeks in September it rained most of nearly every day, thus creating trying conditions.

As an indication of the more serious difficulties encountered in this work, the following from the report of one of the parties is of interest :

"Considerable risk," says the report, "was encountered in ascending the Klinaklini river, as it was in flood, with the current most of the way, averaging four or five miles per hour, and in places six to ten miles.

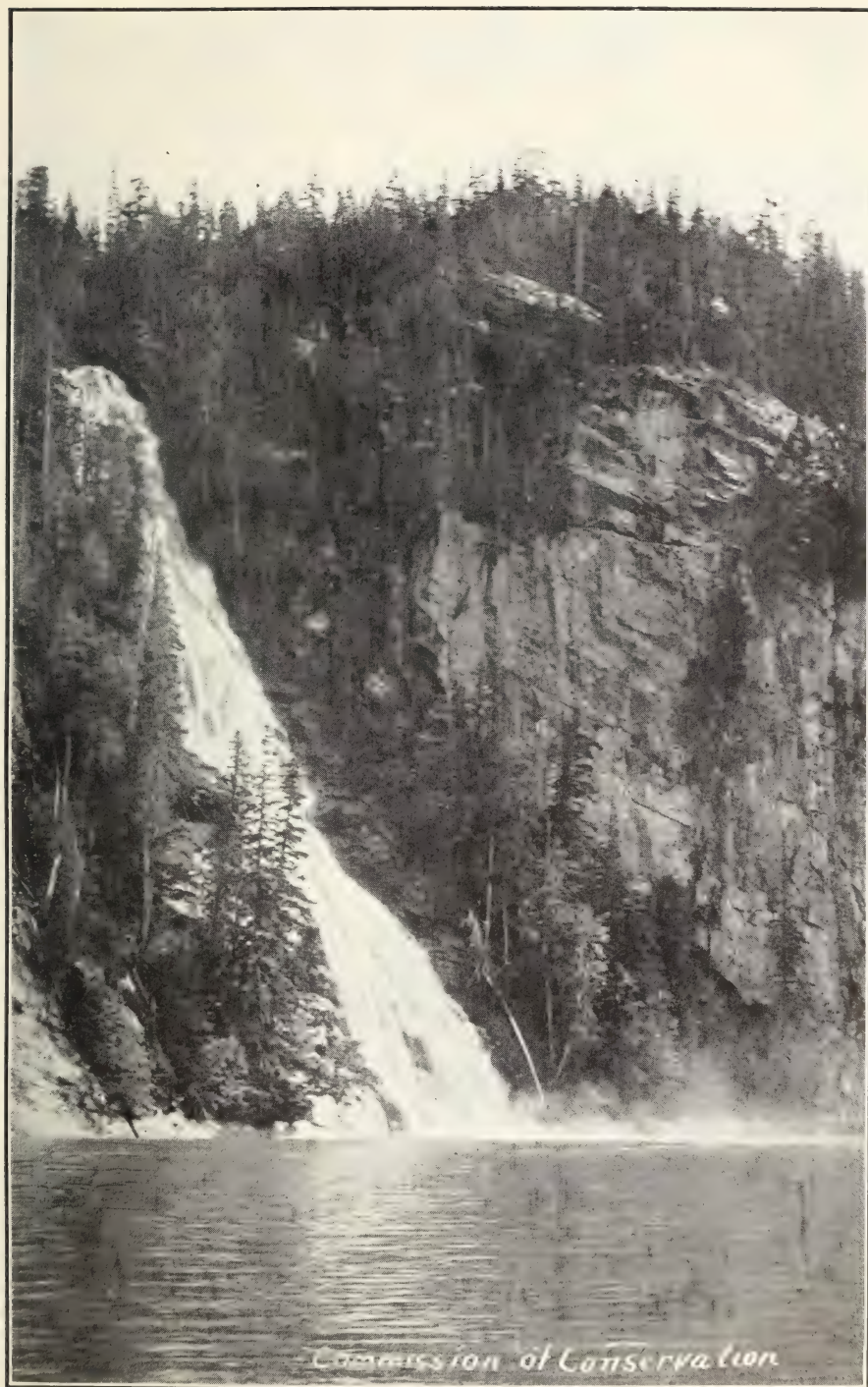
"Sometimes the canoe had to be dragged along by means of the overhanging branches of bordering trees. The water being too swift for oars or paddles, and too deep for poling. At some places it was necessary to wade for several hours in water at a temperature little above freezing. In places, quicksands were met with. When poling, sometimes the pole would sink six or eight feet in quicksand before finding firm bottom. After seven days' hard work we reached the main forks of the river. One fork was coming from a glacier obstructing the valley, while the other fork consisted of a long cañon up which it was impossible to proceed by canoe. This cañon was examined for fifteen miles. On the return trip we were unfortunate enough to be wrecked on a snag while rounding a sharp bend, and lost our canoe and equipment. Two other parties on other work, who had made similar attempts the previous year, were also wrecked, but these had failed to reach the forks. After the accident we had to walk two days without food or blankets, to the mouth of the river, swimming two small branches *en route*, and we were pleased indeed to see the *Lizette* again."

**Work on
West Coast**

The West Coast party left Victoria on July 4th, and returned on November 11th. The total distance travelled by the launch was about 2,400 miles. The engineers, in addition, travelled hundreds of miles up and down streams, going by small gasoline boat, or by canoe, back packing, pack horses, rigs, etc. Most of the investigating work had to be done by forcing a way through the thick Coast bush.

The party consisted of C. J. Vick in charge, C. C. Lyall, B. N. Simpson, and C. S. Cowan. A. Fuehr, the launch engineer, remained with the boat, and, amongst other duties, kept a record of the barometer.

The forty-feet gasoline launch *Lizette*, chartered in 1912, was purchased in 1913. When the purchase of the boat was decided upon, as the Department of Lands were purchasing a number of gasoline launches for the Forests Branch, it was arranged that, at the end of the season, the *Lizette* would be transferred to the Forests Branch. Though she was less convenient than the special type of launch adopted for the forest work, the Hon. W. R. Ross provided for the taking over of the boat, as previously proposed, and I desire to express my hearty appreciation of his consideration in this matter.



WATERFALL ON NORTH SIDE, GARDNER CANAL
A typical British Columbia West Coast waterfall.

In the 1913 report, some doubt was expressed respecting the advisability of sending more than one party in one boat ; however, it seemed best to make another effort along these lines, and two parties were again sent in the same launch. The basic idea in planning along this line was : that one party would go up one stream, the other party up another, and the engineer would manœuvre the launch so as to pick the men up on their return, and with the least possible loss of time. This year the plan worked out admirably, and the little loss of time that unavoidably occurred, between the times of return of various parties, was an insignificant fraction of the extra cost that would have been incurred in operating an additional launch outfit.

The route followed was from Victoria, *via* Nanaimo to Toba inlet, and from there *via* Shoal bay, Bute inlet, Knight inlet, Alert bay, Queen Charlotte sound to Rivers inlet, and from there to Gardner canal. The return was *via* Mussel inlet to Alert bay where headquarters were made while investigating the rivers on the north-east coast of Vancouver island. Some work was performed on Campbell river *en route* back to Victoria.

A portion of the season was necessarily spent in examining, more fully, certain streams, which had been but partially explored in 1912. Efforts were made to examine the larger rivers, while the small streams received such attention as could be given them without undue expenditure of time.

Work in Northern Interior

The party that worked in the northern interior consisted of G. H. Ferguson in charge, A. J. McPherson of the British Columbia Water Rights Branch, F. G. Bird and B. Corbould. This party assembled early in July in Hazelton, and outfitted there. We had learned that the cost of saddle and pack horses in the Hazelton district was considerably greater than we had had to pay in the Quesnel district. It was decided, therefore, to engage horses in Quesnel, where they were secured at \$1.00 per day each. Unfortunately, the trails from 150-Mile House to Hazelton were heavy and the pack train reached Hazelton after 21 days, somewhat travel worn. However, after a little rest a good start was made, and the examination on the Skeena and its upper tributaries was commenced. The telegraph trail was followed, and the rivers *en route* examined to a point a few miles above the junction of the trail to fort Connolly, above telegraph cabin No. 4, one hundred miles north of Hazelton. Hazelton was again reached on August 20th and some time spent in taking levels, meterings, and examining the territory in the immediate vicinity

of that place. The party on September 6th proceeded along the line of the Grand Trunk Pacific and examined the Bulkley, Telkwa and Morice rivers and their tributaries.

Speaking of some of the trails, the report of the engineer says :

"The trails of the Kispiox watershed were not much travelled and consequently not well marked and required clearing, so that, progress was necessarily slow, also such bridges as existed were rotted and unfit for traffic.

"The trails of the Skeena River valley were very badly cut up and full of mud holes, and, where they followed the side hills, very slippery and dangerous so that horses slipped and fell frequently, being thus cut and bruised and otherwise injured. On one occasion, one of the horses fell off a bridge, breaking two of its ribs and being otherwise injured so as to be no longer fit for use. The main trail up the Skeena river passes over a series of hills and deep-cut gulches which are practically bare with comparatively few spots where sufficient feed for working animals can be obtained. The season of 1913 being exceedingly wet and cold in the northern interior, the grasses did not ripen, making in consequence very poor feed. This, added to the rough condition of the trails, made the horses very weak and entirely unfit for a long season's work."

I have no doubt the field men had their hands full and worked zealously.

The interior work was concluded on October 24th, after which Mr. Ferguson made a hurried trip to Whitehorse, Yukon, and ran a line of levels over the Lower White Horse rapids on the Lewes river.

Through the co-operation of Mr. Young, Comptroller of Water Rights, a rapid examination of the Osoyoos and Similkameen districts, and of part of the territory along the boundary extending to Grand Forks, was made. Mr. Young arranged that his District Engineers, Messrs. C. Varcoe, of Grand Forks ; W. J. E. Biker of Nelson, and H. B. Hicks of Cranbrook, would gather certain information in these areas which it had not been possible for us, before, to canvass. It was necessary, however, to engage an engineer specially to cover the portions of the Okanagan, Similkameen and Skagit districts. Mr. J. C. Dufresne undertook this work, and has contributed information which will enable us to present characteristic features of the waters of this district.

In general, the Province has already been canvassed from the International boundary to the line of the Grand Trunk Pacific, and also some territory north of the railway.

Many excellent photographs were secured by the field engineers, but of course the prevalent rain often interfered with the taking of such.

Commission of Conservation



MORICETOWN FALLS, BULKLEY RIVER, NORTHERN INTERIOR, B.C.

**Operating
Costs**

With respect to the cost of operating the parties for food and travel, it may be interesting to observe that, during 1912, in the Cariboo district, the average cost of food per man per day for the Quesnel River investigation was \$0.80; for the Blackwater River district, \$1.00; and for Willow and Bear rivers, \$1.20. A fair average for the food for this work would be about \$1.00 per man per day. Saddle horses were usually secured for a party for \$1.25 to \$1.50 per day, and pack horses from \$1.00 to \$1.25 per day. Frequently the man who was renting the horses would accompany the party as packer, receiving wages for his services. Where this could be arranged the man was generally willing to rent his horses at a lower rate.

For the Northern Interior party, in 1913, the cost of subsistence in the field ranged from about \$1.10 to \$1.40 per man per day. As the roughness of the trails prevented the use of the horses for as long a period as had been originally planned, the cost per day per horse is high. It cost \$59.00 to bring each horse to Hazelton and return it to Quesnel district. Distributing this cost over the time the party were able to use the horses in the field, each horse cost nearly \$2.50 per day. The cost per horse per day including the time of the two packers was \$2.75. Almost always, each man has a saddle and a pack horse, therefore, the cost of transportation per man per day would be about \$5.50.

In 1913, the coast party were away from Victoria 130 days. Taking the cost of the hire of the launch, and adding to it the wages of the launch skipper, the cost of gasoline, oil, insurance, and sundries, it is found that it cost to transport, exclusive of meals, the four engineers who were engaged on the field work, \$2.70 per man per day—a low rate.

The cost of food for the 130 days, during which the launch was in commission, works out at less than 70 cents per day per man, which, bearing in mind the high prices of food on the coast, must be considered a really low unit cost.

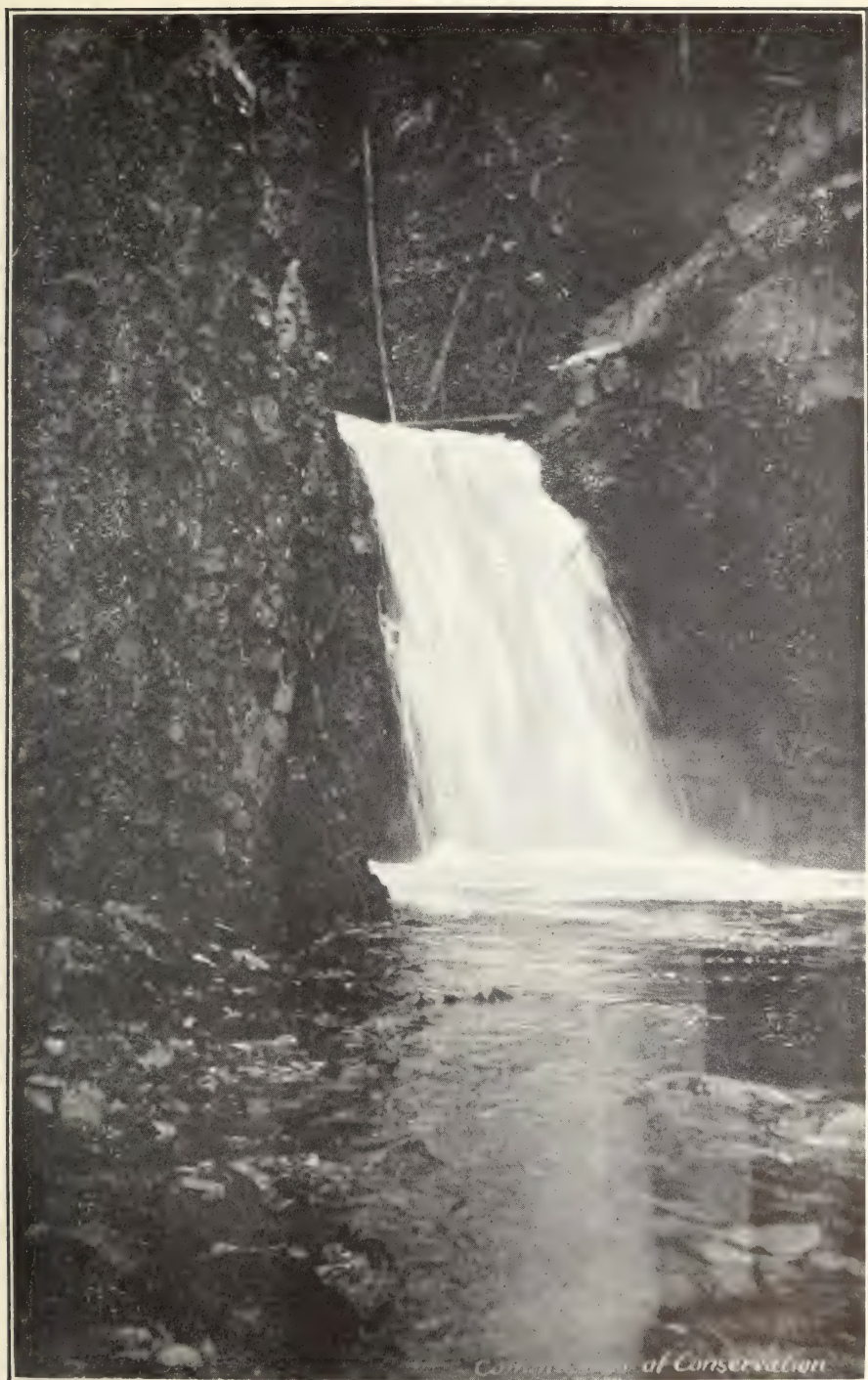
The preparation of the various field and other data is well in hand. The report will also include subject matter dealing with the law of the Province relating to waters, to procedures under the law, as well as to other cognate matters. Various records related to the issuance of water certificates, to special legislation conferring rights and privileges relating to waters, and to similar subjects have been under examination. References to all these matters will be included in the report.

**International
Boundary Waters** British Columbia has a large number of streams which cross, and some of which recross, the International boundary, and, in connection with the utilization of these waters, questions may arise which will create problems requiring consideration by the International Joint Commission.

Under the Boundary Waters Treaty of 1910,* provision is made that waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other. The Treaty contains provisions governing the erection of obstructions for the making of diversions, whether temporary or permanent, of boundary waters on either side of the line affecting the natural level or flow of boundary waters on the other side of the line ; and it also provides, that, where there has been any interference with, or diversion from their natural channel, of waters on either side of the boundary, resulting in any injury on the other side of the boundary, the injured parties shall have the same rights, and be entitled to the same legal remedies as if such injury took place in the country where such diversion or interference occurs. Thus, by way of illustration, the courts of British Columbia are open to the citizens of the state of Washington, and *vice versa*.

Some of the streams which cross the International boundary require careful consideration in their possible economic relations. On the United States side there are some power sites which, if fully developed, might have important economic bearing upon possible developments in British Columbia, and also *vice versa*, either by attracting industries, or competitively affecting rates. For example, there is the possible development at Kettle falls on the Columbia, and also, on the same river, the proposed development at 'The Dalles,' at which latter site it has been estimated that a *minimum* of 300,000 (24 hour) horse power, at a cost of \$6.89 per horse power per year may be produced. Again, there is the *Permit* granted in 1913 by the United States Federal Government involving the development of power on the Pend d'Oreille river (Clark fork) at location Tps. 39 and 40 N., R. 43 E. Willamette meridian, Washington, which permit calls for an installation within three years from 1913, of 50,000 horse power. This power site for the purposes of the permit is deemed, and has been taken to be, a 112,000 horse power possibility. Very extensive power possibilities exist on the Pend

* The Boundary Waters treaty is reproduced as Appendix I, of the *Water Powers of Canada* (Commission of Conservation, Ottawa, 1911). The International Joint Commission maintains offices for the Canadian section at Ottawa, and for the United States section at Washington, D.C. Each office is in charge of a permanent Secretary.



LOWER PORTION OF FALL ON GRANITE CREEK, B. C.
A typical cascade in the Skeena River district of British Columbia.

d'Oreille in its short course in Canada from the International boundary to its confluence with the Columbia river at Waneta, B.C.

It will be perceived, therefore, that, both with respect to treaty obligations and to economic and other factors, the province of British Columbia is especially interested in the power and other potentialities of its boundary waters. The gathering of information respecting boundary waters is not being overlooked either in Canada, or in the United States.

During 1913, I assisted in the preparation of some special reports relating to subjects connected with waters. I attended several meetings of the International Joint Commission in Washington, Detroit, and elsewhere, besides devoting considerable personal attention and study to matters relating to a proposed regulation of the level of the lake of the Woods, and tributary waters, as covered by an official *Reference* submitted to the Governments of the Dominion of Canada and of the United States.

Personally, I cannot refrain from here expressing my appreciation of the intelligent and persistent efforts of our own field men.

In concluding this brief survey of the work I am certain the Commission of Conservation appreciates highly the assistance which the Government of British Columbia has extended through the Hon. William R. Ross, Minister of Lands; also the hearty co-operation extended, in 1911, by the Acting-Comptroller of Water Rights, Mr. J. F. Armstrong, and during 1913, by the present Comptroller, Mr. William Young, and the able members of his staff. Mr. H. W. Grunsky has rendered valuable assistance in connection with certain phases of the water legislation enacted by the Province during the last two years, and also in other ways. Other members of Mr. Young's staff have also generously contributed to advance the Commission's work.

In addition to assistance previously acknowledged I would like specially to mention the favour extended by the Hon. W. J. Bowser, Attorney General, through the Provincial Secretary, Mr. A. Campbell Reddie, who provided assistants, Mr. J. S. Soutar and Mr. W. Smillie, Jr., to aid in a somewhat tedious research into certain records of which we desired knowledge. Thanks are also due to these assistants. Mr. H. A. Wildy also assisted in research work in the Provincial library.

The British Columbia Electric Company, Western Canada Power Company, West Kootenay Power and Light Company, Shuswap Power Co., Prince Rupert Power Co. and several other companies; as well as practising engineers, have also again assisted us.

Without these co-operations we could not have achieved these results and this assistance on the part of so many is a favour which the Commission does indeed most highly esteem.

A Plea for City Planning Organization

BY

G. FRANK BEER

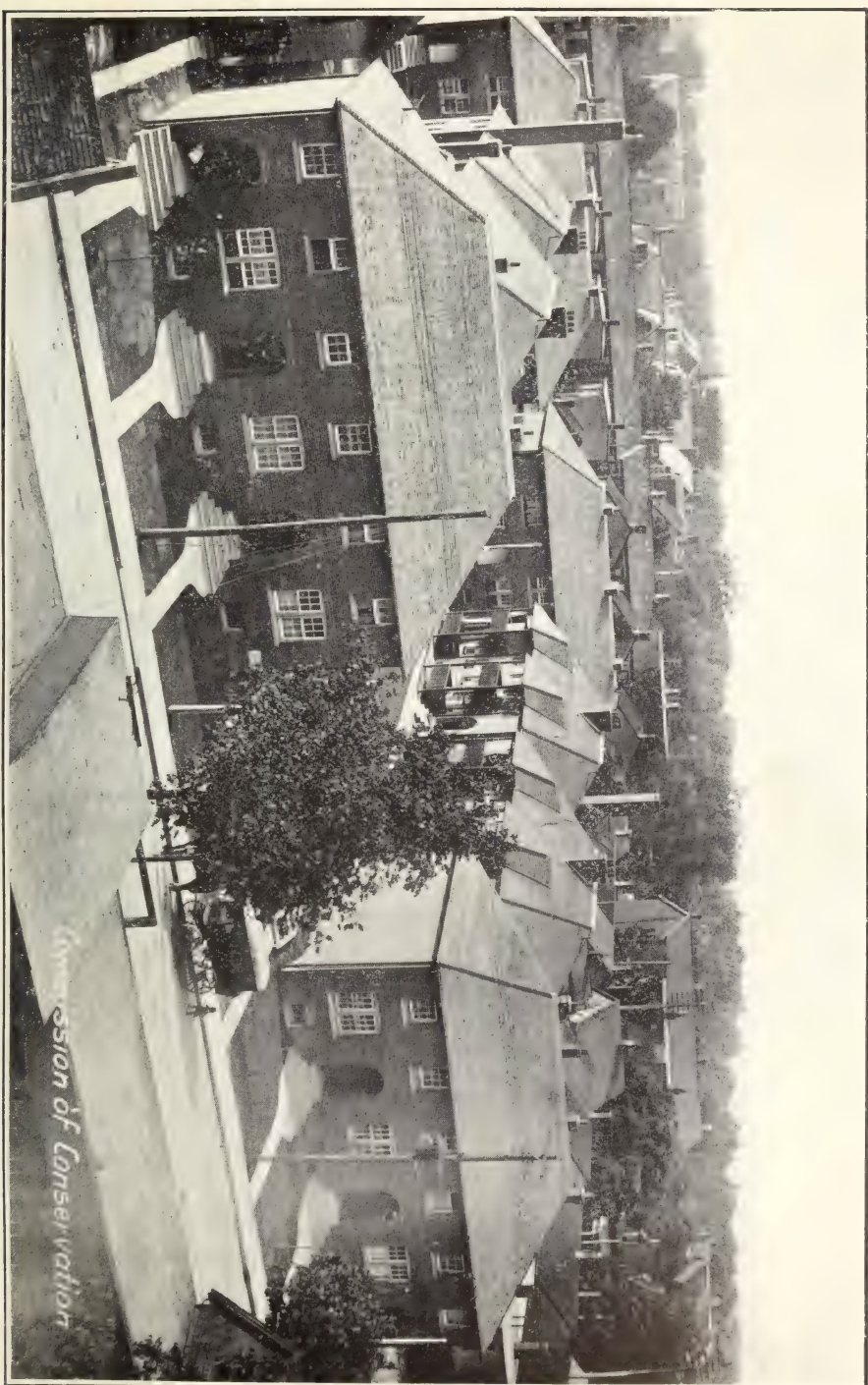
President, Toronto Housing Company

THE tendency of population to centralize is resulting in an unprecedented growth of towns and cities in all countries. In Canada, this unusual growth is augmented by a large inflow of foreign immigrants. Under existing conditions, the result is a matter of small satisfaction, for, too often, as Viscount Bryce has said, "a big city is a big evil." This fact, however, in no way serves to check the growth. On the contrary, villages quickly develop into towns; towns, in a decade, become cities, and the problems of large cities increase in geometrical ratio to their size.

With a suddenness that is almost startling, we find our cities both in the east and in the west confronted by problems which they have neither the experience nor the machinery to cope with. Added to this is the misfortune that the administration of cities in Canada is largely in the hands of those who have no special training or qualification to deal with problems that are taxing the mature experience and best talent of older cities.

Take, for instance, the matter of transportation. The main street which easily served for the village traffic becomes seriously congested. Transportation was a simple problem when the houses of villagers with their gay gardens were grouped around the corner store. But in the rapidly growing city the grouping together of factories and huge office buildings places an insupportable burden upon transportation facilities. The checker-board plan of city subdivision, unbroken by diagonal thoroughfares and with too little provision for rapid transport, entails an excessive waste of time upon citizens going to and from their work. I know of cases where masons and carpenters are required to travel for over an hour after leaving their homes in order to reach their work. Such conditions will continue and will grow worse until proper city planning methods are put into practice. To-day, civic management requires men possessing foresight, men who are specially trained in solving difficult questions of engineering, sanitation and transportation, as they are affected by the growth of the city into the immediately adjoining territory.

Here and there in Canada students of municipal problems have for some time endeavoured to secure legislation and machinery to co-ordinate the development of urban and rural communities. But



COTTAGE PLATS, SPRUCE COURT—TORONTO HOUSING CO.

our national absorption in supplying the material things called for by the rapid growth of population, has made it difficult, if not impossible, to secure public attention for matters of civic betterment. Here and there something has been accomplished, but nowhere has it been adequate, nor has it in any degree furnished a standard for other communities to follow. Nor is this, in a measure, to be wondered at. A knowledge of civic government and city planning is to be acquired only by patient and thorough study. I shall perhaps not be misunderstood if I add that few of our city fathers have this knowledge. Much would be accomplished for the public welfare in Canada if wise guidance were provided through an organization similar to the British Local Government Board. In the meantime, practically no Canadian municipality is taking sufficient thought for the future in planning for water supply, transportation and other public services.

**Progress of
City Planning**

There was a time when city planning was looked upon as a fad, something ornamental rather than useful. Many good movements, even that for the conservation of natural resources, have shared the same criticism. That time, however, happily is past. To-day, the three leading countries of the world, Great Britain, Germany and the United States, are wide-awake to the value and necessity of providing the machinery required to carry out this work. In England, the Town Planning and Housing Act, an evolution of the Public Health Act, has proved a most effective piece of legislation. The cities of England are literally being made over again. This Act is now recognized to be of national importance owing to the improvement in living conditions effected by its operation. A large increase in the powers of the Local Government Board, which administers the Act, is a direct result of this recognition.

In Germany, city planning has reached its highest development. Difficulties, which to us seem insurmountable, have there been solved upon lines which time has shown to be sound and sufficient. The orderly and astonishing growth of German cities affords self-evident proof of this. Indeed, a knowledge of city planning and its effect upon the welfare of the people of Canada might well begin with a thorough study of German methods and legislation.

The latest great nation to awaken to the significance of this new movement is the United States. The Massachusetts legislature, at its last session, provided for the establishment of local Planning Boards in all cities and large towns. The duty of these boards is to make a careful study of the resources, possibilities and needs

of the city or town, particularly with respect to conditions which may be injurious to the public health. A further duty of the board is to make plans for the development of the municipalities with special reference to the housing of their citizens. Ex-Governor Foss, when calling representatives of all the cities and towns in the State to a conference concerning the operation of the Act, stated that, the object of the gathering was to focus attention upon, and to emphasize the importance of, the city planning movement, which, he stated, was "fundamental in its relation to all other projects for civic betterment."

In New York city, an important and largely attended exhibition to illustrate city planning methods, projects and results has recently been held.

Objects of City Planning What then is the object and scope of city planning and how can legislation and machinery, not at present existing in Canada, be best secured to attain the desired end?

The subject may be roughly divided into three sections,—Sanitation, Transportation and, what, for want of a better name, I shall call Co-ordination. These may be subdivided as follows :

Sanitation :

- (a) An adequate supply of pure water.
- (b) Sanitary and economical disposal of sewage and garbage.
- (c) The prevention of slums and provision for the satisfactory housing of wage earners.

Transportation :

- (a) The arrangement of transportation systems, including radials, and the location of passenger stations and freight sheds.
- (b) The development of harbour facilities, including the erection of necessary wharves, bridges and docks.
- (c) The laying out of thoroughfares to accommodate the necessarily varied traffic.

Co-ordination :

- (a) The laying out of desirable manufacturing districts and provision for adequate shipping facilities.
- (b) The planning of residential districts, especially for working men, so that they may be housed within reasonable distance of their work.
- (c) The location of municipal produce markets in proper relation to residential districts and shipping facilities.



Spruce Court, Playcourt From Spruce St.—Toronto Housing Co.

(d) The systematic selection of recreational facilities, such as parks, play-grounds and swimming baths.

(e) The location of educational institutions, such as schools, colleges and public libraries.

(f) The proper distribution of public service buildings, such as fire halls, police stations, post-offices and hospitals.

(g) The acquiring of natural beauty spots and their development as public squares and breathing spaces.

(h) The acquiring of land needed for the purposes enumerated under the five last paragraphs, before an enhanced value places unnecessary burdens upon the public exchequer.

(i) Provision and planning for car-lines, sewage-, gas-, and water-mains, telephone and electric light wires, to secure the greatest possible economy in their installation, and to avoid the usual waste of repeated tearing up of pavements and consequent dislocation of traffic.

(j) The laying out of the surrounding territory so that the natural and inevitable growth of the city may be rationally and economically guided.

The list is a long one but nothing included is superfluous. Briefly, however, city planning requires *efficiency, economy and vision*.

Economic Aspects

Some years ago the æsthetic aspect of this subject was considered the one of paramount interest. It is, however, the economic value of such planning that has brought the matter prominently before the public and won for it many friends and exponents. The millions of dollars spent upon the widening of main thoroughfares, after the erection of expensive buildings, has increased the cost of such improvements. The rounding of corners and widening of important intersections at large expense have aroused the ratepayers to seek the cause of such avoidable expenditures, which are evidently due to lack of foresight. The subject is many-sided and naturally the emphasis has been placed by those discussing it, upon the features that most appealed to them. The medical health officer, the business man, the engineer, the architect, the artist; each finds in it something of special interest. The reason is not far to seek, for at its base city planning implies *conservation of life, and the elimination of waste*. The *thinking before doing*, which is involved, makes for the beauty which is inherent in *things fitly planned*, in so far as they affect the physical development of our cities.

Neglect and lack of foresight in planning cities lead to needless expense, and, when ratepayers find that heavy expenditure is necessary to remedy the results of early neglect, the tendency is to curtail the expenditure. The effect is inevitable. A few years later, they are faced with the same problems in aggravated forms, the remedies are still more expensive and the money spent upon half-remedies is found to have been largely wasted. The prevention of such waste is one of the objects of modern city planning.

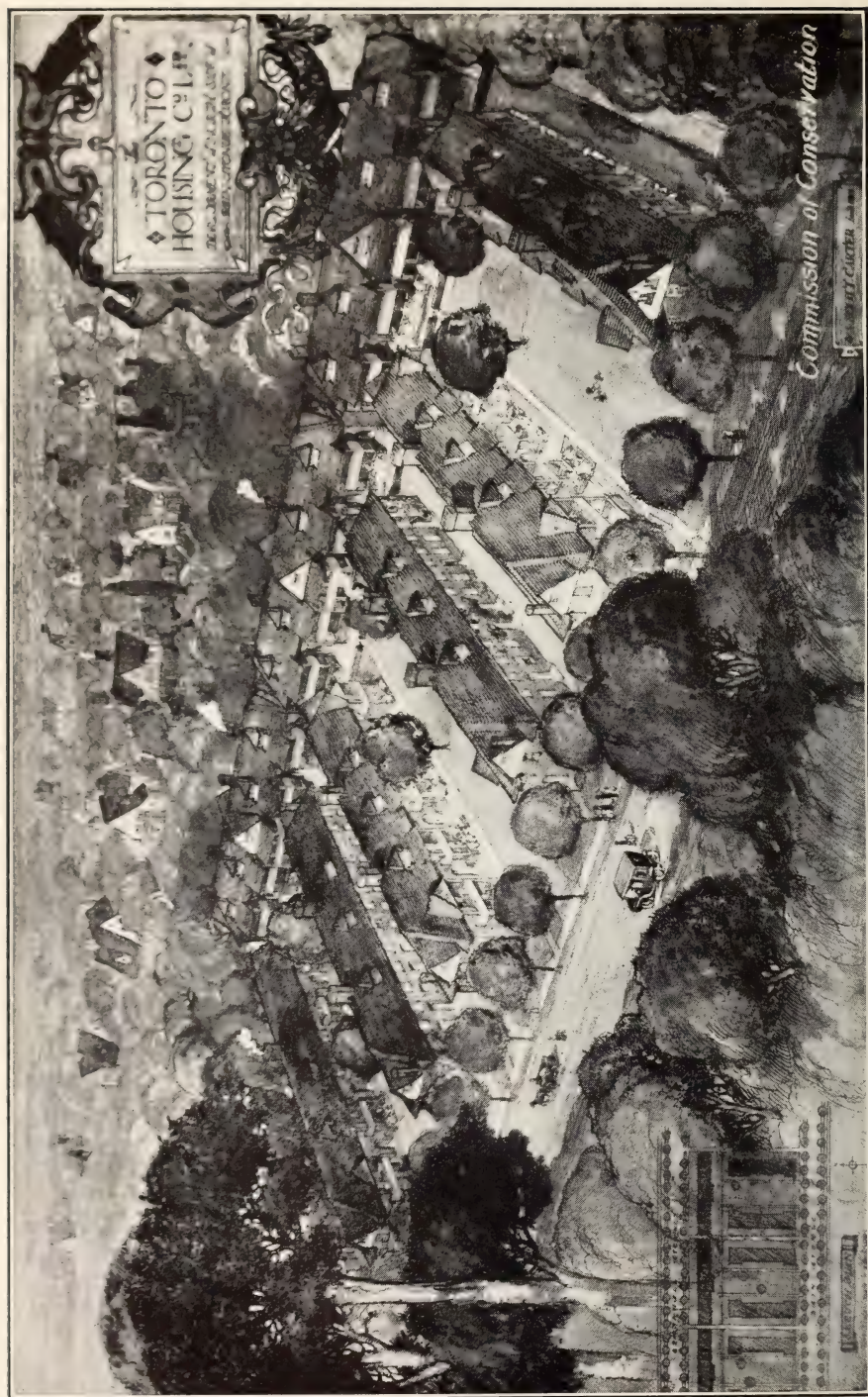
As cities grow they naturally encroach upon the territory surrounding them. The result is a divergence of interests which works to the disadvantage of both city and country. Notice, for instance, the ill-kept roads immediately adjoining cities where a working agreement has not been arrived at between the city and suburban districts. Not infrequently, too, there is a clashing of interests between nearby towns and cities in reference to water supply and sewage disposal. Machinery to adjust all such differences and co-ordinate the natural development of town and country is the main object of what, for want of a better name, we call city planning. The subject really has a much wider application than is implied in its name. The interests of town and country are alike involved.

We greatly need some organized body to explain to the people what can be done in Canada and what is now being done in other countries along the lines indicated. In addition to this, we need in every province and city, wise, enabling legislation and a qualified board to administer the same.

Lessons from Europe

In any effort to frame housing and city planning legislation and to provide machinery to meet Canadian needs, European experience will teach us much, but, in the main, our problems are Canadian problems deeply affected by our local conditions, ideals and existing organization. We cannot, without careful consideration, transplant a German, or even an English, solution to Canadian soil. The same thorough study which evolved a Town Planning and Housing Act for Great Britain must precede workable and satisfactory legislation for Canada. Where so much is involved, it is folly to expect a ready-made solution on the shelves of any public library.

Housing legislation must also be framed as an inseparable part of such work. We are all so absorbed, necessarily, no doubt, in our own businesses, that we have failed to realize the development of housing conditions which shame our civilization. Is it necessary in Canada for thousands of families to occupy but one room each and thousands of other families to occupy but two rooms each?



GENERAL VIEW OF PROPOSED DEVELOPMENT BY TORONTO HOUSING CO., ON BAIN AVE., TORONTO

Is it really necessary in Canada, that thousands of houses, built for one family and with one set of sanitary conveniences only, should house two, three, four and even six families? Dr. Hastings, Medical Health Officer of Toronto, has estimated, that in Toronto there are still three thousand houses occupied by from two to five families each. Do we expect permanent progress and decent family life to continue under these conditions? Only those faced with it, know of the distressing and degrading effects of over-crowding. We all know that the morals of a community are moulded largely by home environment. The very existence of the family life, upon which we pride ourselves, is dependent upon decent housing. Living conditions have a psychological, as well as a material side. Ideals and refinement surely die unless a reasonably favourable environment is provided for their exercise and development. Our boast should be, not how many fine houses there are in our cities, but how few poor, unsanitary and unworthy ones. Indeed, the problem is not confined to our cities; one may find living conditions in our country districts comparable with city slums. Slums produce inefficiency; inefficiency begets poverty; and poverty of this character results in disease and degradation. This is not sensationalism; it is cold fact. Simply as a matter of common sense, we should wipe out our slums and prevent their growth. Sooner or later it is we who shall have to pay the bill.

In a country as generally prosperous as Canada, the ownership of his own home should not be an unattainable ideal for a working man of steady habits. As Sir Oliver Lodge has recently said: "Our conceptions of the possible need training and widening." No measure will so tend to the realization of this vision as to have our cities intelligently planned with residential areas, factory districts and transportation facilities linked up in some reasonably co-ordinated plan. One-half of the housing problem is a problem of transportation.

A year ago I could not have spoken so strongly but circumstances have since brought to my notice the almost incredible housing conditions that exist throughout Canada. A remedy is possible or our social organization is merely a veneer. I do not believe that it is, but it is possible that we are in danger of being overwhelmed by an accumulation of material interests and are denying to higher things their proper place.

CITY PLANNING IN TORONTO

A few years ago, a movement was inaugurated in Toronto, having for its object, among other things, the establishment of play-grounds,

so that city boys and girls might have a desirable substitute for the immeasurably superior advantages enjoyed by those fortunate enough to have been born in the country. Through the efforts of a few private citizens, chief of whom was Sir Edmund Osler, the necessity of play-grounds, equipped and supervised, was so fully established, that at present the cause needs no advocacy. Its benefits are acknowledged everywhere.

The purchase of land for play-grounds in a very congested district drew attention to the undesirable houses that had been built in the lanes of the city. It was for the children of just such neighbourhoods that play-grounds were desired. So a number of these houses were bought, torn down, and the lots turned into a fully equipped and supervised playground, now named the Osler playground in honour of its generous donor. The living conditions thus disclosed, after several years of study and education, resulted in a housing movement, which is now endeavouring to do for housing reform what has been so well done for play-grounds. One outcome of this movement is the formation of the Toronto Housing Company, which is now spending its first million dollars upon the erection of decent cheap houses for wage-earners.

The chief result of the movement was, however, that it led the company to seek the causes of play-ground and housing deficiencies, congestion of population and transportation difficulties. Careful study has shown that the lack of city planning lay at the root of these, and many other civic evils. Ex-Governor Foss of Massachusetts has well said : "*This is fundamental in its relation to all other projects for civic betterment.*"

RECOMMENDATIONS FOR FUTURE WORK

Commission Can Assist

No single means will be found sufficient to check existing evils and prevent their further growth.

The Commission of Conservation can, however, in a large and convincing way, point out to the people of Canada, what has proved of great social and economic value elsewhere, and thus prepare public opinion for the adoption of similar methods.

It is highly desirable that a Housing and City Planning Conference be held each year under the auspices of the Commission of Conservation. Possibly this might take the form of a special annual meeting of the Committee on Public Health. Such a meeting would receive large publicity and the educative effect would be wide-spread and of great value. Local organizations would doubtless be formed throughout Canada as a result of such conferences, and the local public interest aroused would go far toward making



Spruce Court, Flats Facing Playcourt.—Toronto Housing Co.

effective action possible. A wide circulation of the annual report of the meeting would further assist in the same direction.

You will remember the satisfaction felt by all thoughtful Canadians when the Commission of Conservation was established. The inaugural address of the Chairman was an inspiration alike to right-thinking and right-acting and has widely affected Canadian thought and action ever since. To include city planning among the activities of the Commission is only to deepen the service it is rendering to Canada. This, too, is conservation,—the *conservation of life and desirable living conditions. The two are inseparable.*

We are now reaping the reward of the campaign of education already begun by your Committee on Public Health and its efficient officers. From Vancouver to Halifax this question is receiving attention as never before. In every civic centre there are citizens with the good-will, but who require advice and guidance to make their good-will effective. As an evidence of the wide-spread interest felt at present in housing you may be surprised to learn that no less than *fourteen* representatives from Canadian cities attended a recent meeting of the American Housing Association, held in Cincinnati.

It should not be necessary for Canadians to go abroad for information, leadership and advice on city planning. The Commission of Conservation should satisfy this want. It is men and legislation that are required, not money nor material means. Much work is required if legislation is to be framed to meet the need in Canada. As I said before, our problems are our own. They are not even American problems, a fact clearly established at the recent Housing Conference in Cincinnati. City Planning and Housing Acts suitable for Canadian cities in each of the provinces can be framed only after the most careful and painstaking study. It may be found that something in the nature of a Central Bureau is desirable, a Bureau to which all our cities and provinces could apply for information, and through which the experience of each could be made available for the benefit of all. Or, owing to the extent of the undertaking, it may be found desirable to form a special committee of the Conservation Commission in order to deal effectively with the whole matter. Whatever action is required, with the Commission behind the work, it can and will be well and thoroughly done. No other body in Canada is so well qualified to guide the study, find the solution, frame the legislation and take such steps as may be found necessary to secure its adoption.

In proportion as population centralizes, *the power of the individual to shape his environment lessens and the responsibility of the State*

increases. To accept this responsibility before avoidable evils have taken firm root, is to exercise true wisdom.

I have urged chiefly the economic value of city planning; it is a very great factor, but health, morals, beauty, and all that make life really worth the living, lie at its very heart. This is work not for the few, but for all. Through it, a standard of living may be established which will demonstrate our moral right to the ownership of Canada.

Work of the Toronto Housing Company

BY

G. FRANK BEER

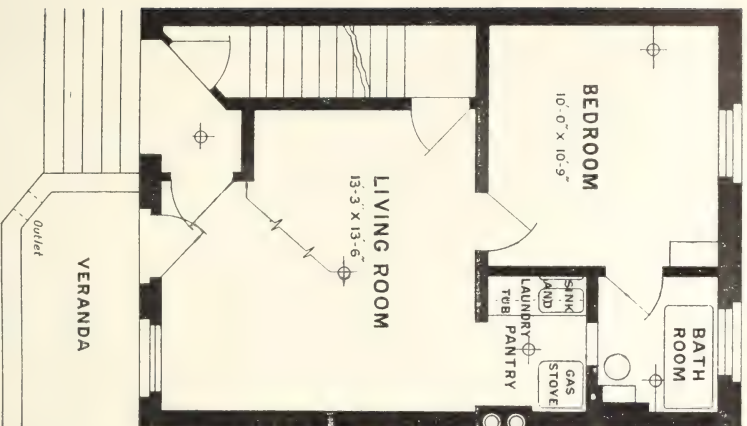
President, Toronto Housing Company

THE Toronto Housing Company was organized by a Joint Committee representing the City Council, the Toronto Board of Trade, the Manufacturers' Association and the Civic Guild of Toronto. Before incorporation, in accordance with the decision of the committee, subscriptions for \$100,000 of stock were secured. In this work, substantial assistance was rendered by a committee of ladies organized at Government House. The charter was granted in May, 1912, under the Ontario Joint Stock Companies Act. It was originally intended to commence operations upon a co-partnership basis, and individual subscriptions of stock were limited to 40 shares, or \$2,000.

At the time of incorporation, a block of five acres of land was purchased from the city. The frontage on three streets totalled 2,050 feet with depths of 100 feet, 108 feet and 130 feet. This land is situated in a desirable section of the city within twenty minutes by street-car from the business centre. Opposite, on one side, is a park of 18 acres with improved playgrounds; and within three minutes walk on the other side, is the street-car line, and a beautiful natural park of 100 acres, containing a river, woods and hills, magnificent play areas for all classes of out-door sports and the city's large zoological collection. At one corner of the property is situated a large public school. While low-lying in relation to most of the surrounding land, the property is well drained and lies at least one hundred feet above lake Ontario, less than a mile away.

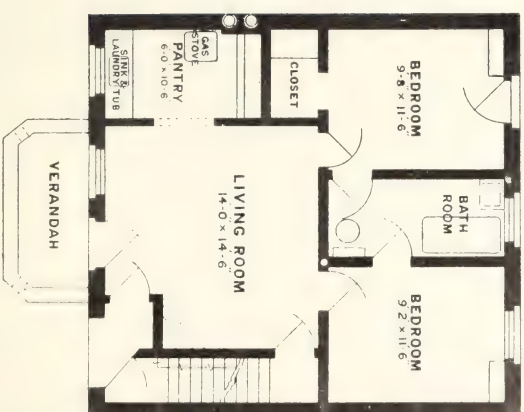
Early Delays A plan for the improvement of the property was prepared by Messrs. Dunnington-Grubb and Harries, landscape architects. It provided for 100 detached and semi-detached houses, and necessitated the slight diversion of

Plan No. 1



ONE BEDROOM—SMALLEST FLAT—
TORONTO HOTSPRING CO.

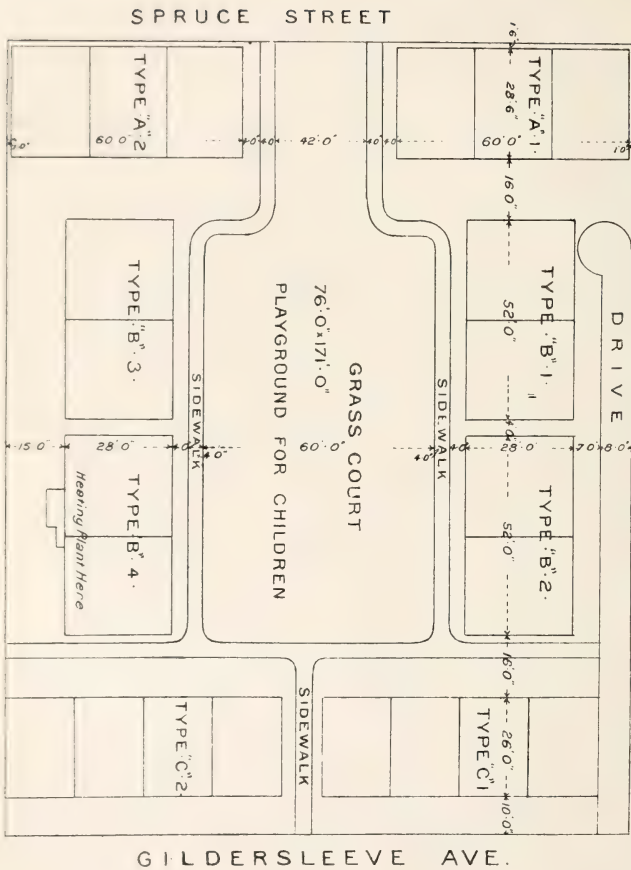
Plan No. 2



TWO BEDROOMS—SECOND SMALLEST FLAT—
TORONTO HOTSPRING CO.

Plan No. 3

Commission of Conservation



GROUND PLAN, SPRUCE STREET PROPERTY, TORONTO HOUSING CO.

the two streets through the property. This required the approval of the city council. Residents in the neighbourhood misunderstood the company's purposes, and made opposition, and the matter dragged along in the city council for the remainder of the year without final settlement.

Early in 1913, the company decided to secure other land nearer the centre of the city and proceed with building operations.

In the meantime the Board of Directors had become convinced that a housing undertaking in a city the size of Toronto would not be large enough to be effective, and at the same time could not be economically managed, with a smaller investment than \$1,000,000. They were convinced also, that it was impossible to secure that amount of money locally at a low rate of interest. The Board took the matter up with Hon. W. J. Hanna, putting all their information at his disposal, with the result that Mr. Hanna introduced last year as a Government measure, a Housing Bill, which passed the Ontario legislature by a unanimous vote, and is now known as the "Hanna Act." It permits town and city municipal councils, under adequate safeguards, to guarantee the bonds of a housing company to the extent of 85 per cent of the money required, the remaining 15 per cent to be stock of the company, paid up in cash.

Operations Commenced

Pursuant to the decision to proceed with building operations, the company on March 1st, 1913, leased from the Toronto General Hospital Trust, a block of vacant land, with 167 feet frontage on Spruce street, by a depth of 207 feet to Gildersleeve avenue—a narrow street with small cottages on the opposite side. The site is directly behind the old general hospital and within twenty minutes' walk of the city's business centre. After carefully considering plans, the company decided that the proper development for this site was cottage flats in two storey buildings, and that the buildings should be built about an open court, which would serve as a playground for the small children away from the dangers of the street. Behind each house, just enough space was left to serve for drying clothes. The buildings designed by Messrs. Eden, Smith and Sons, architects, were built by contract at a cost of \$60,000. Two central hot-water heating plants and two plants to furnish domestic hot water were installed. The decision to heat the houses was arrived at primarily with a view to lessening the labour of the house-wife and thus better the social condition of the entire family. Two types of flat were built. The smaller consists of living room, small pantry-kitchen, bedroom,

bathroom, basement and rear balcony, as shown in plan No. 1.

The larger flat consists of living room, pantry-kitchen, two bedrooms, bathroom, clothes closet, basement and front verandah, as shown in plan No. 2.

The six-room houses were built in two rows—three houses in each—facing Spruce street.

The ground-plan of the Spruce street property is shown in plan No. 3.

A gas stove and combination sink and laundry tub were installed in each kitchen, electric lighting fixtures and window blinds were supplied throughout all the houses. The rents were made upon a basis to pay six per cent on the stock, five per cent interest and one per cent sinking fund on the bonds, taxes, water rates, insurance, provision for vacancies and upkeep. In addition, the company collects in monthly payments, a reserve fund for interior repairs, which, at the end of the year or at the end of a tenancy, is returned to the tenant in cash, less the cost of any repairs that the company may consider necessary. This fund is as follows :

For the smaller flat—\$1.00 per month.

For the larger flat—\$1.50 per month.

For the six-room house—\$2.50 per month.

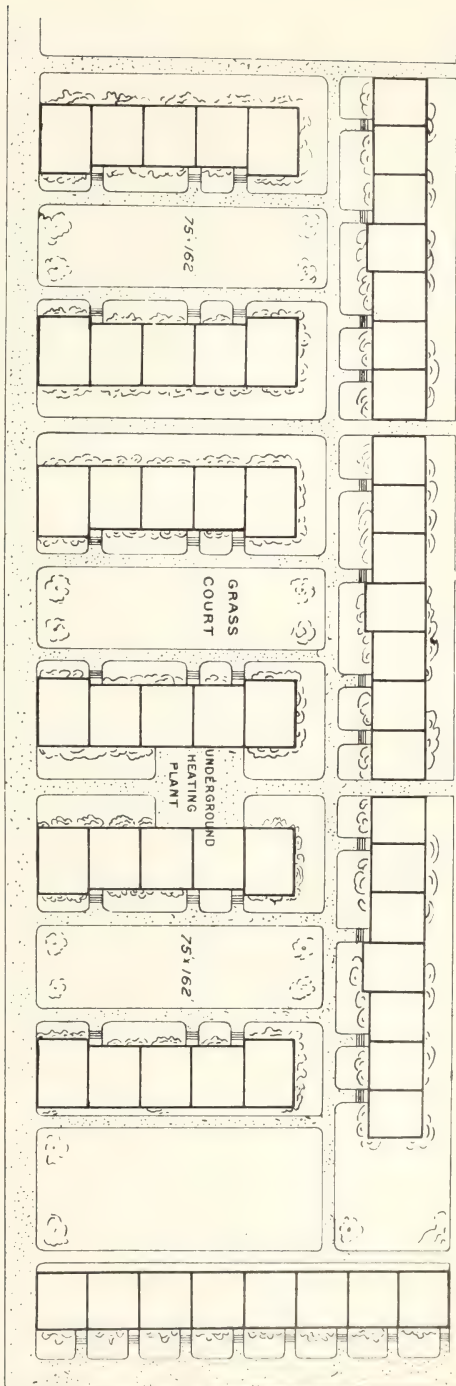
The charge for heating is included in the rent and is collected during eight months. The monthly rentals, with the reserve fund for repairs, are as follows:

	Eight months October to May			Four months June to September			Average monthly rental
	Rental	Repair fund	Total	Rental	Repair fund	Total	
Small flat . . .	\$13.00	\$1.00	\$14.00	\$10.00	\$1.00	\$11.00	\$12.00
Larger flat . . .	18.50	1.50	20.00	14.00	1.50	15.50	17.00
Six-room house . . .	29.50	2.50	32.00	20.50	2.50	23.00	26.50

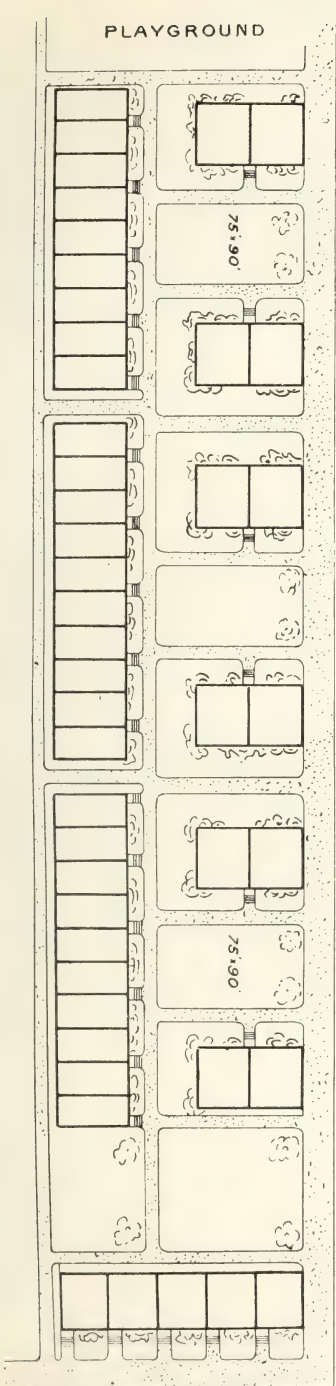
All the cottage flats could have been rented three or four times over by the time they were ready for occupation. All the six-room houses are rented, but they were not found to be in such demand as the cottage flats.

Commission of Conservation

SPARKHALL AVE.



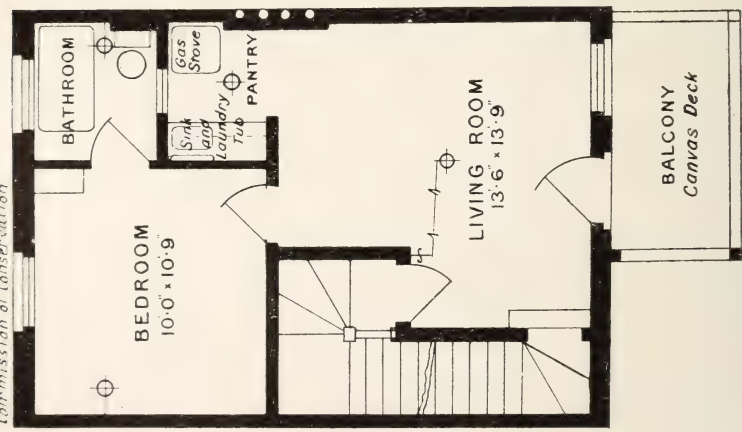
BAIN AVE.



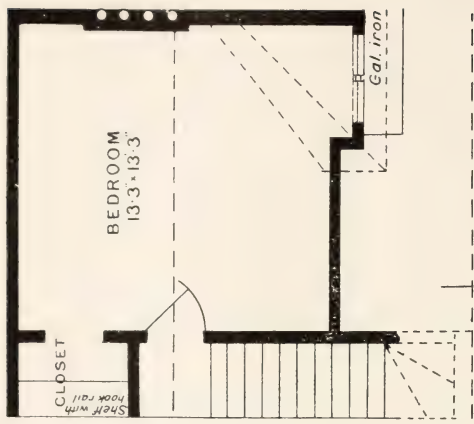
LOGAN AVE.

GROUND PLAN, BAIN AVENUE PROPERTY - TORONTO HOUSING CO.

Commission of Conservation



Plan No 5



TWO BED-ROOMS—SMALLEST FLAT AND AN ATTIC—TORONTO HOUSING CO.

The tenants and their occupations are as follows :

In the sixteen smaller flats

Engraver and wife.	Salesman and wife.
Telephone operator and mother.	Telephone operator and two sisters.
Electrician and wife.	Labourer, wife and baby.
Stableman and daughter.	Labourer, wife and baby.
Labourer and wife.	Gardener, wife and child.
Electrician and wife.	Coachman, wife and child.
Labourer, wife and baby.	Mother and daughter.
Pressman, wife and baby.	Street car conductor and wife.

In the sixteen larger flats

Mother and three daughters.	Mother and two daughters.
Chauffeur, wife and mother.	Cutter, wife and two children.
Electrician, wife and three small children.	Teamster, wife and son.
Chauffeur, wife and three children.	Widow and five children.
Labourer, wife and five children.	Hotel doorman, wife and nephew.
Electrician, wife and two children.	Widow, son and daughter.
Gardener, wife and two children.	Labourer, wife and daughter.
	Compositor, wife and son.
	House servant, wife and two children.

In the six-room houses

Salesman, wife and three children.	Three brothers and three sisters. (All adults.)
Furniture dealer, wife and two children.	Plumber, wife and nine children.
Book-keeper, wife and baby, wife's sister and brother.	Caretaker, wife and three grown-up daughters.

The rents have been fixed (after providing for heat) to produce nine and one half per cent upon the cost of buildings and land. In future developments, the rents will be fixed to produce ten per cent, and the company recommends this basis as desirable to ensure ample margin for the future of such an undertaking.

Having abandoned the first plan for the Bain avenue land—the five-acre block purchased from the city—because of the opposition to it, the board decided that the next best form of development for this site would be cottage flats, and a ground plan has been adopted, as shown in plan No. 4. There are three large play-courts. All the houses face the courts, and, as at Spruce court, only enough space is

left at the rear of each building for the drying of clothes and to ensure sunlight and air. There will be accommodation for 118 families on the north side of Bain avenue and for 86 families on the south side. A central steam plant will provide heat and hot water.

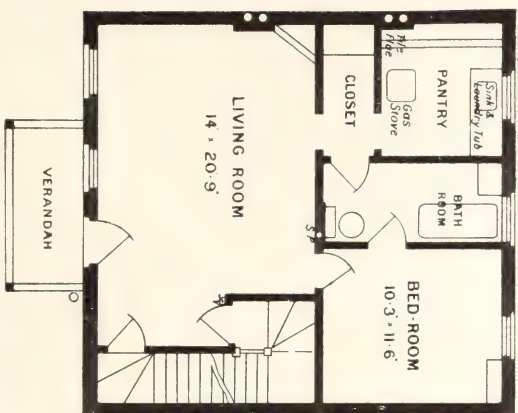
A larger flat, one with three bedrooms, was designed, and by utilizing the attics in conjunction with the upper flats throughout this development, other types were secured, affording a range of accommodation from one to four bedrooms. The types of cottage flats provided on Bain avenue in addition to those on Spruce street, are shown in plans Nos. 5, 6, 7 and 8.

The buildings north of Bain avenue are under construction and will be ready for occupation in June, 1914. Thus far, the company has carried on its construction work by contract. Sufficient applications for the Bain avenue flats have already been received to ensure all of them being rented as soon as they are ready for occupation.

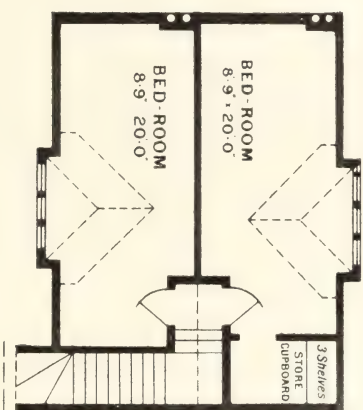
It should be stated in conclusion that the Toronto Housing Company does not regard cottage flats as the ideal form of housing. Under the conditions governing at present in Toronto, cottage flats were considered the most desirable type of dwelling for the particular parcels of land available for immediate development. In Canada, as in England, the ideal of housing is the individual house. But the cottage flat is not an apartment house or a tenement; each one has its own front entrance, its own bath-room, its own basement and its own verandah or balcony.

THE CHAIRMAN : Gentlemen, I am quite sure we are all very much interested and instructed by what our friend, Mr. Beer, has said. What we want on the subject of town planning and housing is something in the way of a systematic start, and the method of starting these movements is so extremely important, that it is worthy of a great deal of consideration, because a wrong start might possibly involve immense expenditures of money to no purpose, and also involve the retracing of steps, after some years. With the object of getting something in the nature of a definite start, I requested certain gentlemen to act as a Committee to prepare draft legislation, which would be referred to the various governments of the Dominion, and after receiving their suggestions, would be brought before the National City Planning Conference to be held in the spring of this year, and considered by a committee of that Conference, where we hope to have men who have had the largest amount of experience in connection with the subject. Col. Burland

Commission of Conservation

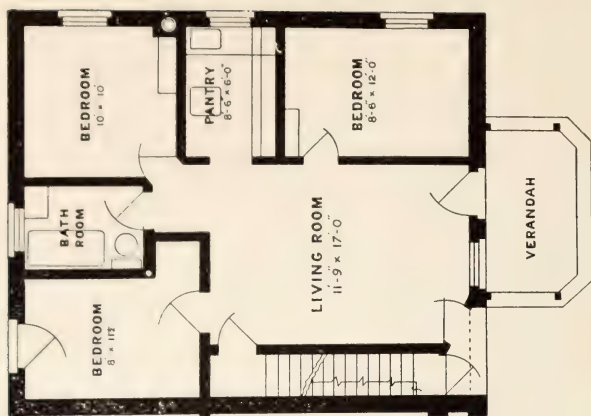


Plan No. 6



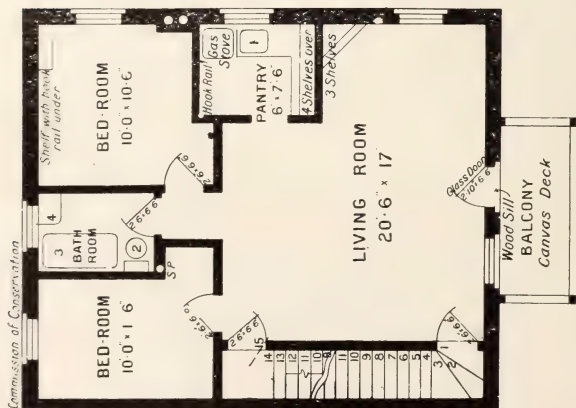
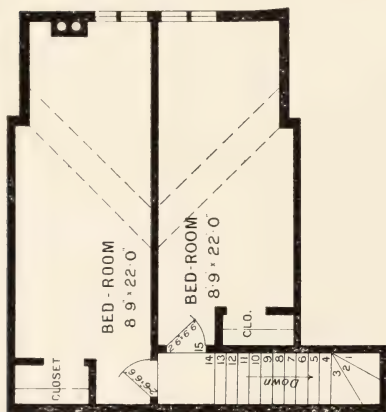
THREE BEDROOMS—MEDIUM SIZED FLAT AND AN ATTIC—TORONTO HOUSING CO.

Plan No. 8



THREE BEDROOMS—LARGEST FLAT—
TORONTO HOUSING CO.

Plan No. 7



FOUR BEDROOMS—LARGEST FLAT AND AN ATTIC—TORONTO HOUSING CO.

is Chairman of that Committee, which has had one or two meetings and has done some preliminary work. We shall hear a few words from Col. Burland on the subject.

Preliminary Report of the Committee on Town Planning Legislation

BY

COL. JEFFREY H. BURLAND

I SHOULD like to give expression to my appreciation of the paper which Mr. Beer has just read on the subject of City Planning, and also to express my thanks to the Assistant to the Chairman, who was so happy in placing Mr. Beer's paper before my own report. It is, therefore, almost unnecessary for me to say anything about town planning, because that has been so well done by Mr. Beer. I shall read to you the first entry in the minutes of the Committee as showing our appreciation of the confidence reposed in us by our appointment and our sense of the importance of the task committed to us for solution.

"Before proceeding with the business for which this meeting has been called, I desire to place on record my sense of the honour conferred upon this Committee and on myself as Chairman, and of the confidence reposed in us in selecting us to consider and advise upon a problem of such vast importance and touching so many interests as town planning legislation. If we succeed in drafting, as I hope we shall, a Bill acceptable to the various legislative bodies and other interests involved, the results of our labours will exercise a far reaching influence on the health and happiness of the people, as well as on the prosperity, morality and dignity of the nation. To procure such results, a careful study of local conditions is desired and a comparison of our methods of dealing or not dealing with them, with the methods adopted by and in practice in other countries.

"If we take as the starting point the belief that every man who earns an honest living is entitled to a decent home, and that a reasonable measure of comfort and even beauty should be included in our construction of that word, we shall, I trust, be able to evolve some scheme of legislation which shall clearly define and carefully protect the sacred rights of all classes of our citizens and thus point the way to securing the greatest good for the greatest number on a permanent economic basis."

As I have said, it is not necessary for me to give any detailed description of the necessity of town planning legislation. I may

say that on the 3rd or 4th of September I received a letter from Mr. Sifton asking me if I would join a committee he was considering appointing for this purpose. I replied that I would, that I was much interested, because it was on the line of work many of us were trying to do in Montreal. The Committee consists of Col. Jeffrey H. Burland, Montreal, Chairman ; Dr. Chas. A. Hodgetts, Commission of Conservation, Ottawa ; J. P. Hynes, Architect, Toronto ; Noulan Cauchon, Engineer, Ottawa ; F. H. Gisborne, Parliamentary Counsel, Ottawa, and M. J. Patton, Toronto, Secretary. The Committee met a number of times at the offices of the Commission of Conservation in Ottawa, but found it impossible to complete so important a work in the limit of time before your Annual Meeting. It was, however, felt that a preliminary or interim report should be laid before you, therefore, I beg to submit the following :

PRELIMINARY REPORT OF COMMITTEE

Your Committee, appointed to consider and formulate a Bill on town-planning and housing suitable to conditions obtaining in Canada, beg to submit an interim report as follows :

Your Committee recognize the keen interest taken in the subjects it has to consider by a large number of the intelligent and public-spirited citizens of Canada, and it has been impressed with the number and influence of the public and semi-public bodies which last year petitioned the Commission of Conservation to direct its efforts to the solution of Canadian town-planning and housing problems. Whilst recognizing this appreciation of the problem by many influential citizens, we regret to report that our observations compel us to conclude that the mass of the people are not fully aware of the baneful effects of allowing cities to expand without planning for the future, and permitting urban population to become congested in unsanitary dwellings and areas. Nor have they a sufficient knowledge of what has been done in other and older countries to prevent and alleviate such conditions. With this view, your Committee unanimously approves of the following resolution :

“This Committee, being convinced of the great economic value of modern town-planning, regret that after most careful consideration they have come to the unanimous conclusion that the public as a whole is quite ignorant of the great advance that has already been made in many cities in connection with town-planning. This Committee would, therefore, strongly urge that the first and essential step is to educate the people upon this point, and would ask the Conservation Commission to give immediate consideration to this most important matter. The Committee would suggest that the

Commission issue publications such as has been done in connection with other matters, arrange for public addresses, and in such other manner as may be available, explain to the people the practical and economic importance of modern town-planning in preserving human life, reducing disease and suffering, in improving the physical conditions of citizens and so placing their earning power in the best possible condition ; in reducing the expense in connection with hospitals and other eleemosynary institutions and in providing for the comfort of the citizens, particularly those with the smallest incomes."

We would urge especially that the Commission take all steps available to educate the public on these points by supplying the press with suitable subject matter and illustrations.

Having been but recently appointed, we have not had sufficient time to prepare our final recommendations, but there are certain general conclusions at which we have arrived and which we desire to place before you.

In the first place, we are convinced that municipal affairs, both urban and rural, are of such importance that whatever powers are exercised by the provincial government upon municipalities or their affairs, should be centralized in, and exercised through a 'Department of Municipal Affairs.' It is a matter of consideration, whether this department be presided over by an existing minister of the Crown or whether a new portfolio be created expressly for it. As a branch of the 'Department of Municipal Affairs,' there should be a town-planning and housing branch or board.

It would be the duty of this board to consider all town-planning schemes submitted to it by municipal authorities and to approve, reject, or modify only after a public hearing had been held. In addition, the legality of all bonds or debentures issued to finance town-planning schemes should be conditional on the board's approval of such schemes. Town-planning experts should be employed by the board to initiate town-planning schemes, or to assist it in modifying, or otherwise dealing with schemes submitted for its approval. The services of these experts should be at the disposal of municipalities, which could not, or would not, themselves provide for the making of proper plans, the cost of such services to be charged back, in part at least, against the property benefited. Sufficient power must also be given the provincial board to enable it to deal quickly and effectively with the expropriation of private property required in the development of a town plan.

We are also of the opinion that the cities and larger towns should appoint a town-planning and housing board, to administer the work

undertaken by them and there should be the heartiest co-operation between these local boards and the provincial board.

It is of the utmost importance that fully qualified men be appointed to these boards, both local and provincial, and it shall be our duty to make recommendations to this end, so that it will be impossible for mere political place-seekers to secure seats thereon.

Your Committee notes with pleasure that already each of the provinces of Alberta, Nova Scotia and New Brunswick has a town-planning act in force.

Your Committee intend to study carefully the working of all town-planning and housing acts now in operation in other countries and by selecting features from these suitable to Canadian conditions, to formulate a draft Bill acceptable to Canadian legislatures. The draft Bill, which will embody the result of your Committee's labours, will be submitted for approval to an International City Planning Conference to be convened in Toronto in May, 1914. We would be deeply grateful for any suggestions that the Commission would be good enough to make on these important subjects.

Before the Committee completes its work it is the intention to hold sittings in Montreal and in Toronto, so that all the members of the Committee may hear something of local conditions in those cities. Dr. Hodgetts is leaving for the West in a short time, and we have requested him to hold conferences with the local authorities in Winnipeg, Calgary, Edmonton if possible, and Vancouver, and with such organizations as exist in those centres for the promotion of the object for which this Committee was appointed.

THE CHAIRMAN : Personally, I feel like expressing my thanks to Col. Burland for coming from Montreal for the purpose of informing us as to what has been done, and I am very much indebted to him for accepting the position of chairman of the Committee. It is a very great advantage to us to be able to secure the co-operation of a gentleman of his well-known philanthropic character and his general knowledge of business conditions, especially in the cities of Montreal and Ottawa. I am satisfied that when we get our draft legislation into shape, we shall have in it the result of mature experience and careful study. As has been stated, the idea of this movement is to get a body of legislation enacted in Canada which will practically furnish a basis, as well as a method for every effort that is made to improve the home conditions of the people in the different portions of the country. Obviously, nothing will be accomplished by spasmodic and ill-directed efforts initiated by people, with the best intentions, but without any expert knowledge,



PROTECTING OUR FEATHERED FRIENDS

Scene on the farm of Mr. J. T. Miner, Essex County, Ontario. Note the wild geese that have been encouraged to visit the farm on their migratory flights. Note also the bird house shown at the left of the picture. Many of these have been erected on Mr. Miner's grounds. Providing such protection for birds is one of the best means of fighting the insect pests that prey on plant life.

or any experience of what has been done in other places. Mr. Beer has had a good deal of experience in that line already, and he knows how easy it is to talk, and how difficult it is to act, and what we hope, in this connection, is to accomplish something in the way of practical results, by getting a practical measure before the International City Planning Conference, to be held in Toronto in May. Then, with all the authority of expert advice and study, go to the various legislative bodies in Canada next year, and endeavour to get it embodied in legislation.

We shall now have a report from Mr. F. C. Nunnick, on the work of the Committee on Lands.

REPORT OF THE COMMITTEE ON LANDS

MR. NUNNICK said : For 1913, the work of the Committee on Lands has been as was proposed at the annual meeting held at Ottawa in January 1913. It may be outlined as follows :

1. The continuation of the diagnosis of agricultural conditions in Canada by means of the agricultural survey work, in order to obtain further reliable data for guidance in future operations. The survey this year was conducted in twenty-seven districts hitherto unvisited by the Commission.
2. The directing of operations upon the thirty Illustration Farms selected by the Commission in 1912.
3. Making arrangements for several more Illustration Farms, held in abeyance from 1912, and the directing of operations upon these since their establishment.
4. The addressing of meetings held on a number of the Illustration Farms and elsewhere, when such could be conveniently arranged without interfering with the regular work of the Commission.
5. The continuation of the illustration plot work with alfalfa in Quebec.

Agricultural Survey

The agricultural survey work this year has been similar to that done in 1911 and 1912, but has been conducted in districts which have not been previously surveyed by the Commission. The survey has included the following :

1. An investigation of areas under crops, crop rotation, crops used, seed selection, varieties of seed used, amounts seeded to clover and alfalfa, comparison of yield with that of ten and twenty years ago, and the uses of manures and fertilizers.

2. An investigation of weed pests, insect pests and plant diseases, with special reference to their prevalency and the time when they were first introduced to the farm, whether increasing or decreasing, estimated loss, causes responsible for the foregoing, and the preventive measures adopted.

3. An investigation of the fuel, power and water supplies. Special attention has been paid to the length of time the fuel supply will last ; to the afforestation of present waste land and the results of planting, where any has been done ; the motive powers for house, farm and field work ; the source and location of water supply for house use and for stock, the distance from possible sources of contamination and how conveyed to the house and conveniences in the houses for conserving human energy.

4. The obtaining of information regarding the amount of stock kept and sold annually, the amount of hay and grain sold and fed annually, the labour problem on the farm, the drawbacks to profitable continuation of the present systems of farming and the branches of farming specialized in.

Fewer men (seven in all) were employed in 1913 to circulate the printed question schedules among the farmers, as it was thought that more uniform results could be obtained in this way. The information desired was obtained from personal observation by these men and the testimony of the farmers, and is now tabulated ready for printing.

In the selection of the districts for the survey work, the Commission received the co-operation and advice of the provincial Departments of Agriculture. The following districts were visited :

Prince Edward Island :

O'Leary, Prince County.

Melville, Queens County.

St. Peter's, Kings County.

Nova Scotia :

Shubenacadie, Hants County.

Windsor, Hants County.

Lunenburg, Lunenburg County.

Port Hood, Inverness County, C.B.

(Port Hood district was also visited in 1912.)

New Brunswick :

Keswick, York County.

Gagetown, Queens County.

Doaktown, Northumberland County.

Quebec :

English :

Richmond, Richmond County.

Hillhurst, Compton County.

(Compton County was visited in 1912.)

French :

Trois Pistoles, Temiscouata County.

St. Polycarpe, Soulanges County.

Yamachiche, St. Maurice County.

Ontario :

Otonabee Township, Peterborough County.

Westminster Township, Middlesex County.

Dymond and Harris Township, Timiskaming County.

Tecumseh Township, Simcoe County.

Admaston Township, Renfrew County.

Manitoba :

Pilot Mound.

Souris.

Gilbert Plains.

Saskatchewan :

Yorkton.

Lloydminster.

Melfort.

Alberta :

Camrose.

Innisfail.

De Winton.

**Illustration
Farms**

During the year 1913, the Agriculturist and the travelling instructors of the Commission have been directing operations on the thirty Illustration Farms which they established in 1912. About 250 visits have been paid to the various farms for the purpose of conferring with the farmers and giving them assistance and encouragement in the use of such means and methods as will improve the quality and quantity of the products of the farm, while maintaining or increasing the fertility of the soil. Among the various lines of work followed on the Illustration Farms are : The introduction of the best known varieties of grain of the best quality obtainable, registered pedigreed seed grown by members of the Canadian Seed Growers' Association, being used in most instances ; the sowing of an adequate amount of clover seed per acre on a portion of the farm for comparison with the portion sown with the lesser amount generally sown by the farmer ;

the practising of after-harvest cultivation to kill weeds and conserve moisture ; the production and application of farm-yard manure in the most economical and approved manner ; the introduction of summer pasture mixtures ; the making use of labour-saving devices and machinery ; and the planning of a rotation of crops which will suit the district and which will best utilize the available labour on the farm.

No definite plan can be laid down which will be applicable to all districts, as each farm presents problems of a local nature, which we are endeavouring to solve after making a careful study of the conditions and needs in each particular locality.

The following letter from one of the farmers doing illustration work in Ontario is a fair example of many which have been received :

"In reply to your request of November 14th, for a few notes on the condition of the crops grown in different ways on our farm, I can assure you I am very pleased to furnish them, as it has been very interesting to us to watch the difference in the growths on the plots, as suggested by yourself.

"In comparing the plots sown with the different thicknesses of timothy, we find that the plot sown with six pounds to the acre has much the best stand, and should, from present appearances, yield a heavy crop of hay.

"The plot sown with two pounds per acre is much too thin and we notice a considerable number of weeds in that plot, while in the other plots that were sown thicker, there are no weeds.

"Regarding the different seedings of clover, we were rather doubtful at first as to the advisability of sowing in the fall, as it did not show up very well early in the spring, and we were under the impression that it had been mostly winter killed. We bought enough clover seed then to resow the whole field with ten pounds per acre, sowing at the same time two acres of the field that had not been sown in the fall. During the summer we noticed that, owing to the very dry weather, there was practically no clover on the two acres that had been sown in the spring only, while on the rest of the field that had been seeded both in the fall and spring, there was a splendid catch. I believe the reason we did not notice the clover in the spring was because the top dressing of manure had covered it and in that way it was able to pull through the dry weather.

"The alsike, sown ten pounds to the acre, looks the best, although the lighter seeding shows up well, much better indeed than our best catch in another field that was sown in the spring. The only disadvantage with thick seedings of clover and timothy in the fall, is that it might tend to lighten the yield of wheat. It is quite possible that the extra yield of clover and timothy would more than repay the loss, if any, in the yield of wheat. We will be better able, after next year's hay harvest, to judge the different seedings.

TOP-DRESSING WITH MANURE

"We have tried top-dressing with barnyard manure on wheat and meadows and we are convinced that it gives much better results than the old way of ploughing down all the manure for hoed crops. It not only helps to bring the young clover and timothy through the winter, but we get the benefit of the manure the season it is applied, while with ploughing it all under, it is not in a condition to help the crop to the same extent, and much of it is wasted, especially on the soil that we have in this district.

DIFFERENT THICKNESSES OF SEEDING GRAIN

"The only tests we made in that line this year were with oats and wheat. The quantities of oats sown were $1\frac{1}{2}$, 2, and $2\frac{1}{2}$ bus. per acre.

"From the appearance of the stooks after cutting, the portion sown with 2 bus. seemed to be slightly the best. It was a little thicker on the ground, but was somewhat shorter in the straw than the $1\frac{1}{2}$ bus. per acre. The part sown $2\frac{1}{2}$ bus. per acre was very short, due no doubt to the dry season, and part being on a higher portion of land. As this has been an extra good fall for wheat, we are unable to tell any difference so far between the thick and the thin seeding.

AFTER-HARVEST CULTIVATION

"I am very pleased to say that the after-harvest cultivation has given good results, with both the grain and roots.

"We cut and threshed separately, two plots of oats of four acres each, the one plot having been ploughed in August and cultivated occasionally during the autumn, and then ploughed at the same time as the next plot, which had been left in sod and ploughed late in the fall. We weighed the grain from the two plots and found that the cultivated plot gave a yield of 180 bus., and the uncultivated plot a yield of 120 bus.

"A difference of 60 bus. at 50 cents a bushel, shows a gain of \$30.00. Counting the cost of cultivating at \$4.00 an acre, it would mean a total cost of \$16.00 for the plot, and that amount deducted from the \$30.00. shows a net gain of \$14.00.

"I believe that the difference in the profit from the two plots next year, working them alike will be almost as much, as the soil on the plot that was cultivated is in a much finer condition and almost free from weeds.

THE GROWING OF ROOTS

"We had a little over $1\frac{3}{4}$ acres of sugar beets, 64 rows in all, 28 rows on the land that had been cultivated after harvest, and 36 on spring-ploughed land. The whole field received a dressing of manure during the winter. The cheque from the sugar factory showed a weight of $19\frac{1}{2}$ tons, and a return of \$108.80.

"We weighed the beets as we took them up and found that the 28 rows on the cultivated plot produced $10\frac{1}{2}$ tons and the 36 rows produced 9 tons of clean beets. After measuring the plots and figuring up the weights, we found that the cultivated land was

producing sugar beets at the rate of $11\frac{2}{3}$ tons per acre, and the spring ploughing at the rate of $8\frac{4}{5}$ tons per acre. The difference would be 5,733 lbs., and this at \$5.63 per ton (being the price we received), would show a gain of \$16.03 per acre, in favour of the after harvest cultivation.

"We had three plots of mangolds, each plot being a little over an acre. In taking them up, we found that the *Tankard Cream Sugar Mangold* produced about 100 bushels more than either the *Giant Red* or the *Yellow Globe*.

"We planted the *Wisconsin No. 7* corn at the same time that we planted the *White Cap Yellow Dent* and the *Leaming*. It made a more rapid growth and at the time of cutting, was more mature than the others. We weighed the corn from a certain number of rows from each plot, but, unfortunately, I have mislaid the figures, but I remember that the load from the *Wisconsin No. 7* plot was much the heaviest. Some of our neighbours who were trying it for the first time were well pleased and intend sowing it again.

"We have not threshed our clover seed but will let you know the result as soon as we have. We weighed the clover and there was just about 6 tons.

"One farmer near here threshed two loads with his threshing machine and got seven bushels. As he just used the cylinder, the same as when threshing grain, he quite likely has as much clover in his chaff and straw as he has in the bin.

"To-morrow, we are going to ship our apples that are being handled by the Fruit Growers' Association. As this is the first association of its kind in the county, we are very much interested in it and are hoping that it will prove a success. When the apples have all been shipped, I will be able to let you know what prices we have received and how it compares with the old way of peddling apples round town in barrel lots.

"If there is anything more regarding any of the plots, that you would like to know, I would be pleased to give you all the information I can.

"The directors of the Ploughing Association acted on the suggestion you made at the match, and we paid two dollars to each of the ploughmen who did not receive a prize. We have about eighty dollars of a balance, so we should be able to finance a match all right next year.

"Thanks very much for the photos. They have turned out very well, especially those taken while cutting clover.

"Hoping that you will be able to make use of these few notes."

Another letter from one of the western men will be of interest, to show how the work is being received in the West :

"I herewith send under separate cover samples of *Marquis* wheat and *O.A.C. No. 21* barley, grown on my farm from seed supplied through G. H. Hutton, Esq., B.S.A., Supt. Experimental Station, Lacombe, Alberta. Ten acres of *Marquis* wheat yielded 404 bus., or an average of 40 bus. to the acre. Ten acres of *O.A.C.*

No. 21 barley yielded 520 bus., or an average of nearly 52 bus. to the acre. Nine acres of *Banner* oats yielded 874 bus., or an average of 97 bus. to the acre. These weights and measures were taken from the threshers' weights and measures when finished threshing on Friday, 31st ult., and are subject to variations. The *Banner* oats are a fine sample, but no better than the *Abundance* and *Sensation* grown alongside, so I did not think it necessary to send a sample.

"It is generally conceded by those who examined the plots of wheat and barley, that they were the best in this settlement, of good strong straw, stood up well and ripened evenly. If not asking too much of you, will you kindly have these samples tested for germinating qualities and let me know your opinion of them for seed purposes, and also give your advice as to what price I ought to ask for them for that purpose. Being an amateur at the business I need some advice in these matters.

"I am not in the least discouraged by the failure of alfalfa this year, and will give it a fair trial next year. I will try to sow it earlier in the season and will follow it up until we make it a success or a total failure."

During this year, several more farms will be selected in districts not definitely decided upon in 1912, the Agriculturist having visited the Maritime Provinces and the West for this purpose. Early in 1913, Mr. Charles Murray, B.S.A., was appointed travelling instructor for the West, and now has charge of the instruction work in Manitoba, Saskatchewan, Alberta, and British Columbia. A number of meetings were held on the Illustration Farms in the eastern provinces, at which the Agriculturist and an Instructor were present to discuss the work being done, and to encourage the neighbours to practise the improved methods.

During the year, numerous requests have come in for the instructors to address farmers' clubs and agricultural society meetings, and wherever possible, without interfering with the regular work of the Committee, speakers have been sent.

The farmers in many of the districts where the Illustration Farms are situated, have formed themselves into Local Improvement Associations and have repeatedly asked for winter meetings. In order to meet these requests, a set of lantern slides has been prepared and arrangements made to give a series of illustrated addresses on the production, care and uses of manure; soil cultivation; clover growing; and the use of machinery on the farm.

ILLUSTRATION PLOT WORK WITH ALFALFA IN QUEBEC, 1913

As in former years, the alfalfa work in Quebec was in charge of Prof. L. S. Klinck, of Macdonald College. Prof. Klinck reports that the results in different centres vary greatly; that few fields

are cut more than twice ; and that alfalfa proves fully as winter-hardy as red clover. His report follows :

The severe winter of 1912-13 injured the stand considerably in the counties of Huntingdon and Brome, but in no case was the loss from winter-killing in these counties sufficiently severe to justify breaking up the fields. Wherever serious injury occurred on the low-lying portions of the fields, the land was disced and re-seeded. In several instances, this method was successful, but in others the season proved too dry in early summer to ensure satisfactory results. In L'Assomption the stand was so reduced by winter-killing that all the fields had to be broken up ; while in Chicoutimi the vigour of the plants had been so reduced as a result of the prolonged heavy summer and autumn rains that the plots seeded in the spring were ploughed up in late autumn.

REPORT OF THE WORK BY COUNTIES

Huntingdon Of the three co-operators in Huntingdon county, Mr. J. Cunningham was the only one who succeeded in getting three cuttings. All cuttings were, as a rule, lighter than those reported in 1912. The extremely hot, dry weather seemed to influence the yield more adversely on the heavy clays of this county than did the wet season of 1912. In this regard the experience of the Huntingdon growers is in accord with the results obtained at Ste. Anne-de-Bellevue during the past summer, where but two cuttings were all that it was possible to get from broadcast plots, without leaving too little aftermath for adequate winter protection.

While the results in this county are not all that could be desired, they have proven sufficiently encouraging to induce each of the co-operators, at their own expense, to increase the area devoted to this crop. Mr. H. S. Tannahill, Trout river, obtained a very good stand on his newly seeded block, while Mr. R. Pringle had a stand of vigorous plants which left but little to be desired. Mr. J. Cunningham, the other co-operator, expects to seed an additional acre next spring on well-prepared land which was in roots the past summer.

Brome The report for Brome is not so favourable as that for Huntingdon. Substantial progress is, however, to be reported. It will be remembered that the first attempts to maintain a stand in this county were wholly unsuccessful. The three fields were then broken up, a heavier application of lime was made and the fields were re-seeded in the spring of 1912. This time a marked improvement was

apparent in the stand and also in the vigour of the crop. Each of the three fields came through the unusually trying winter of 1912-13 in surprisingly good form, considering the comparatively small growth made by the young plants the year before. As the season advanced, however, it became evident, from the uneven growth, that the plants were suffering in places from causes other than drought. As the stand was still good, all the fields were given a dressing of basic slag, and, where composted manure was available an application was made after the first crop had been removed. The result was that the stand has not only been maintained, but has been considerably improved on two of the fields, but on the third field it has remained stationary. Light applications of a complete fertilizer, on limited areas of this block, have thus far proven unsuccessful in stimulating growth. Two cuttings were obtained from each of the fields in this county, but both were much too light to be considered satisfactory. We are, however, getting information on the causes which contributed to our failure in earlier trials, and we have good reason for confidently expecting that alfalfa will yet be successfully grown in Brome.

L'Assomption

In this county all the plots were so badly frozen out that they were broken up early in the spring. As satisfactory arrangements could not be made with one of the co-operators, work was discontinued with him. Mr. C. A. Foisy and Mr. N. Marsolais, however, continued the work and prepared their land according to directions. Both harvested a splendid nurse crop of barley in August, and both secured an excellent stand of alfalfa. The leaf spot did considerable damage to Mr. Foisy's plants after the nurse crop had been removed, but Mr. Marsolais's two acre block presented the finest appearance of any alfalfa field I have ever seen in the province. The stand was almost perfect, and the growth vigorous and healthy. Naturally Mr. Marsolais was highly gratified with the results, especially in view of his inability to secure a satisfactory growth in earlier trials.

Chicoutimi

The two fields seeded in Chicoutimi in the spring of 1912, were drowned out in the autumn owing to excessive rains. These fields were re-seeded with a nurse crop of barley in the spring of 1913, and Mr. Thomas Simard, who has direct oversight of the work in this county, reports that the alfalfa came on well in the spring, made a good growth during the summer and went into the winter in promising condition.

Summary As the two fields in Chicoutimi were drowned out in the fall of 1912, but nine fields wintered. Of these, three were completely killed and had to be broken up in the spring. The remaining fields, while injured by ice on low-lying situations, withstood the trying winter conditions even better than did red clover. All the fields seeded in the spring of the present year, have done much better than usual, and several are exceptionally fine. In every case, the nurse crop of barley has given a good yield without interfering with the development of the young alfalfa plants. The marked improvement in the stand and vigour of the plants on two of the three fields in Brome is especially encouraging. At the same time, the fact that two of the co-operators in Huntingdon have, at their own expense, increased their acreage, while the third has an additional acre in good condition for seeding in the spring, is the strongest evidence that those who have had the most experience with this crop are the ones who are most strongly of the opinion, that alfalfa will yet be grown extensively in the province of Quebec.

(Signed) L. S. KLINCK

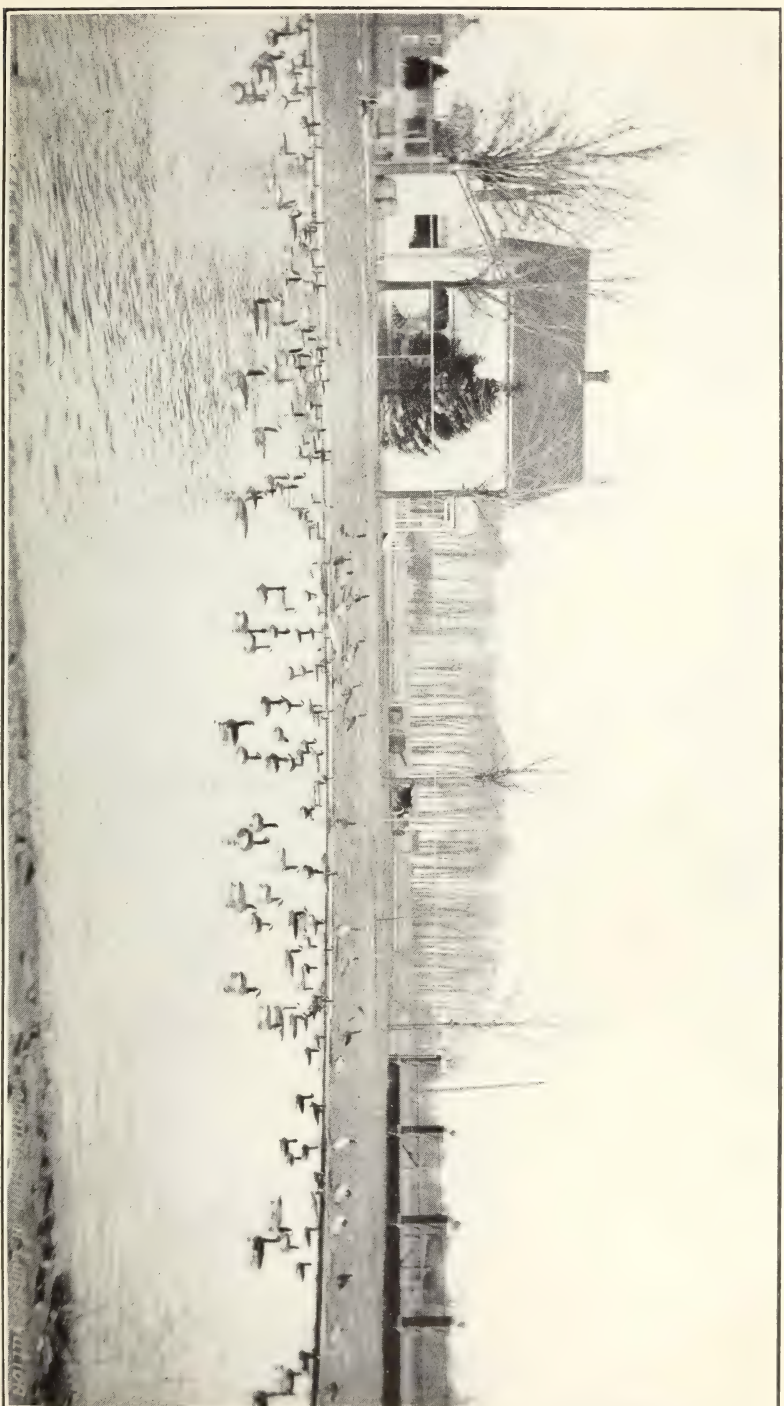
THE CHAIRMAN : We shall now hear from Mr. John Fixter concerning the work done on the Illustration Farms.

ASPECTS OF ILLUSTRATION FARM WORK

MR. FIXTER said : Mr. Chairman and gentlemen, as I did not know that I was to be asked to address you until a short time ago, I have not been able to prepare a paper, but have simply put down a few notes. I am asked to discuss the progress of our Illustration Farm work.

In undertaking this work two years ago, we found the farmers somewhat indifferent as to what was desired of them. However, after having had a few meetings on the farms they became much interested.

During the past year we had no trouble whatever in getting the farmers to do what we asked them to do, and to even go further, and carry out illustration or demonstration work on their own account. For example, let us consider a case in Essex county, Ontario. That is a great corn country. We found the farmers growing the same variety of corn year after year and using the same methods of cultivation. We encouraged them to grow a different variety, one that we thought better suited to the conditions of the soil and climate of that district. The result was a marked improvement in the corn grown last year. On one farm the corn crop, which was especially



WILD GEESSE ON PREMISES OF MR. J. T. MINER, ESSEX COUNTY, ONT.

For several years Mr. Miner has been providing food for wild geese as they passed his farm on their migrations in the spring and fall. A start was made by capturing and clipping the wings of a few young geese, which, when placed on the pond near Mr. Miner's house, attracted others, until now hundreds of geese visit the farm every year.

good, was situated by a roadside, and was the source of much interest to the other farmers in the neighbourhood. The owner of this farm has made such a perfect success of his corn growing that the neighbours have all examined his corn and have bought to use for seed purposes, as much as he can possibly spare. More than that, they are forming a corn association to supply other sections of the country with good seed. This farmer has one of the very best plans for saving seed corn that I have seen. Every cob is impaled on a nail, in such a manner as to allow the air to circulate freely around it, so as to permit of it drying perfectly. I have lately received a test from him which shows that 99 per cent of his seed will germinate—and all strong growth. That is a splendid showing. If a corn association can be formed in that district and the farmers co-operate to grow corn in carload lots, instead of growing a great many different varieties and in small quantities, then, I consider that a marked advance has been made.

**The Farm
Labour Problem**

One of the most vexing questions that confronts the farmer to-day is that of labour on the farm. I say that the best solution of that problem is to keep the boys and girls on the farm. But how are we to keep them there? There is too little in their work that attracts them, and we must endeavour to make it more interesting. The farmer used to plough his land in the autumn, harrow it in the spring, sow his grain, and then look over the fence until the crop was ready to harvest. No one can find much of interest in that. If it was a good season, the crop was good; if it was a bad season, the crop was bad. In the latter case the weather was blamed. But it was not the weather at all; it was generally the method, or lack of method, of cultivating and seeding the farm. Where such conditions are met with by the Commission's instructors, a careful study is made of the farm. Then they suggest that certain experimental work be done, in order to ascertain what crops are suited to the farm, as well as to illustrate the results when specific methods of cultivation and seeding are practised. Thus, the farmer is asked to sow a certain amount of seed on one portion of a field and a certain amount on the other portion of the field, or perhaps different varieties of grain are suggested. Then when the Commission's instructor visits the farm during the summer, he finds that the farmer's boys are interested, and are watching closely the growth on the illustration plots. That is the sort of thing that adds zest to the lives of the boys on the farm, and goes a long way in having them remain on the farm. I could give you many instances of that very thing that are happening to-day. Get the boys and the men interested

in their work, and the labour question will largely solve itself. It is not all a matter of dollars and cents.

Dr. Robertson, when he addresses this meeting, will probably furnish you with concrete instances of increased yields on these illustration farms. I hope he will do so, to show that this work is not only interesting, but is most profitable. I know of no other plan that will so increase the crops of the country, and no better plan for generally improving the conditions of agriculture than keeping the boys and girls on the farm.

**Nature of Work
Done**

In eastern Canada there are a large number of farmers who are operating their farms under the direction of the Commission's instructors. We have found that when a farmer can be induced to adopt better cultivation he takes a greater pride in his crops, and he usually has something to be proud of. Many different experiments are tried out on these farms. We are getting the farmers to sow different kinds of clover and different amounts of clover seed per acre. Similar work is being done with timothy. We are not only sowing different quantities and varieties of grain, but we are having the soil cultivated in a different manner from that in which it is done by the average farmer. We are, in short, paying more attention to the preparation of the soil. As a result of all this, the farmers have obtained much better crops than they had heretofore. In addition, the growing of several crops side by side, but under different conditions, presents comparisons which are not lost upon them.

I asked one farmer, with whom we were working last summer, to leave a portion of one of his fields, so that we could have some of it cultivated in the ordinary manner, and could provide extra cultivation for the remainder. This was done in order to illustrate the value of extra cultivation to other farmers who would visit the farm on excursions organized by the Commission. It was found that on the portion which was left as the average farmer leaves it, three horses had to be put on to cultivate the field, whereas the extra cultivation put on at the right time enabled two horses to do the work. Thus, not only were the results better, but less actual labour was required to obtain them.

I requested one of our Illustration Farmers in the province of Quebec to sow a different kind of corn. He said: "We might as well try several varieties," and he sowed ten varieties of corn on the one farm. That is perhaps a little extreme, but we were willing to let him go as far as he liked so long as he was not going to lose any

money by it. His object in having the ten varieties was to ascertain the one best suited for the soil of his farm. We had two splendid excursions to this farm, one in the spring and one at harvest time, and keen interest was taken in this farmer's work.

Many farmers think that it is not worth while to put nitro-culture on red-clover seed, but it has proven that it is an excellent thing, especially on any farms where clover has hitherto been difficult to grow.

Again, we are encouraging farmers to grow pure seed grain, which is badly needed all over the country. We hope by another year to have very much accomplished in that line.

You will perhaps wonder how it is that we can advise farmers in different sections of the country as to proper varieties of grain for them to grow. But our work brings us into touch with the methods of farmers all across Canada, and so we have splendid opportunities for learning under what conditions each crop may be grown most successfully.

Farm Gardens We are not only encouraging the farmers to grow better crops, but we are endeavouring to make the farm home and its surroundings more comfortable and attractive. I have found many farmers who have never had a garden of any kind. In such cases we advise the farmer to plant some vegetables and small fruit and the result is in many cases most gratifying. On one of these farms, a young lady in the family became interested in this garden work, and found ready sale for garden truck in a neighbouring village. She also has a flower garden, and was able last year to grow sweet peas nine feet high, a thing I had never seen before. She is planning to enlarge her garden this coming year so as to supply the whole village with vegetables.

I have in mind another woman whom I wanted to encourage in growing vegetables. She said : "I have too many chickens around to grow vegetables." I replied, "You can, if you wish, put the vegetables out in the corn field or the potato field and let the men take care of them. Then, too, you could have a flower garden there as well." The result was that last year she had a fine garden and plenty of flowers and vegetables.

In going from farm to farm we try to create a greater interest in all lines of farming engaged in, and, where possible or desirable, we endeavour to introduce new lines. If, for example, we see a flock of mongrel poultry, we advise the owners to obtain a strain of pure-breds. Sometimes the women on the farms become interested

in pure-bred poultry, and, in some cases, are very successful in raising them.

In the summer we invite all the farmers in the immediate neighbourhood of our Illustration Farms, to visit these farms at intervals. We take over the fields, discuss the different kinds of crops and tell them how we cultivate the soil, how to take care of and to apply barnyard manure and discuss good farming in general. When the farmers get tired walking over the fields we get them under a shade tree and give them a little talk on feeds and the feeding of livestock.

I have attempted to give but a hurried outline of our methods of working on our Illustration Farms. It is a great work that we have before us. I thank you very much for giving me the privilege of addressing you.

Dr. Murray then took the chair.

THE CHAIRMAN : The next report we have on the programme is that of Dr. James W. Robertson, on behalf of the Committee on Lands.

Work of the Committee on Lands

BY

DR. JAMES W. ROBERTSON

Chairman, Committee on Lands

MR. CHAIRMAN and gentlemen, as Chairman of the Committee on Lands I preferred to have the work done described by the men who were in closest contact with the people and the operations of our scheme. But it was thought desirable that I, as Chairman, should indicate the object of the work done by this Committee.

The agricultural survey was planned for the purpose of collecting information with respect to Canadian farming methods and conditions, and we have a great deal of information collected, and compiled. But it is not enough to collect and arrange information, or even to disseminate it by publications. There must be object lessons based on it and put in actual practice throughout the country. The Committee on Lands, in doing this work, has not encroached, and does not intend to encroach, upon the executive or administrative functions of government. But before the Commission is in a position to exercise another of its functions, namely, advising as to the best methods of conservation through farming, it is essential that a great deal of local information be obtained. This can be best secured from farmers who try out approved methods on their own



DEVELOPING THE CO-OPERATIVE SPIRIT

Numerous meetings of farmers similar to this one, have been held on the Illustration Farms of the Commission of Conservation.

farms. That is not experimental farm work, that is not college work ; it is research investigation into what is practicable and beneficial under the social and economic conditions of the country, and a proper line for this Commission to follow. That can only be ascertained by trials in the several districts where the Illustration Farms are located.

By our agricultural survey on 2,245 farms chosen in groups of about thirty, we discovered alarming conditions with respect to weeds. I can see more weeds in one half hour in most parts of Canada—except the newer portions of Alberta—from the railway windows, than I saw in three weeks in travelling over six countries of Europe. How then, can this be remedied ? Not by sitting in an office and directing the farmer what to do. He does not obey the regulations requiring the destruction of weeds. But he would, if he were shown that it would pay him to keep his fields clean, that clean fields mean larger bins of grain, and in addition, the reputation of being a good farmer with the fertility of his land preserved. Now, the Committee on Lands is endeavouring to assist the farmer to solve such problems, so that Canada may merit the reputation of being a land of great opportunities and become a land of great achievements and of great production. To effect that the Committee on Lands arranged the formation of Neighbourhood Improvement Associations out of the farmers who composed the several groups whose farms were visited under the agricultural survey. Then one farm of the group was chosen as the Illustration Farm. The particular farm and farmer were chosen by the groups of farmers themselves. The Illustration Farmer is the one of themselves who has agreed to carry on his farm work for his personal advantage and for the improvement of the farming neighbourhood. He receives about six visits per year from counsellors employed by the Commission of Conservation. The members of the Neighbourhood Improvement Association of the district also go over his farm twice a year and discuss with him the methods of growing crops and the management of the farm business. The Commission does not pay any salaries on these farms, or buy or lease any farms. It takes no responsibility, other than to provide the best advice that can be obtained ; and the profits all go to the farmer. Public money is expended wisely when it serves the interests of a great wide body of the people. So we do not hire the Illustration Farmer ; he is an intelligent citizen, and we co-operate with him and the members of the Neighbourhood Improvement Associations by furnishing the counsel of trained experts. There are 2,245 of these farmers assisting in this work. They are our outdoor associates.

These Illustration Farmers are coming to mean more to their neighbours because in a very real sense they are helping their communities to advance.

There was some complaint in political quarters that certain people had not been consulted in the selection of the Commission's Illustration Farms. I have no hesitation in saying that if the selection of the Illustration Farms had been left to the local politicians we would have had Conservative or Liberal farmers as the case might be, without any regard to the farmer's qualifications as farmers, or to their being acceptable to their neighbours as leaders. There is no friction between the Department of Agriculture and the Commission in regard to the choosing of these farms. The selection was practically by the farmers themselves of the group whose farms had been surveyed in respect to weeds, rotations and preservation of fertility.

I could give you many examples of the increased yield that has been obtained by the farmers on our Illustration Farms. One man in Waterloo county, near Galt, Ont., had fifteen bushels an acre more oats on his field, by the new method of cultivation, than he had on the same field alongside ; and he expects the same piece of land to give as much more next year as a result of improved methods of cultivation. This farmer is beginning to realize the old birthright of the human race, to have dominion not by collecting but by creating. He reported an increase of three tons of sugar beets per acre, worth \$16. Other Illustration Farmers reported increases of oats of from eight to ten bushels per acre. One farmer in eastern Ontario reported that his crop of roots for stock feeding purposes was two-thirds greater on the part of the field managed according to the suggestions of the Commission of Conservation than on the remainder of the field. They all say they will have as much better crops next year with far fewer weeds and more time in the spring for spring work, as the land will not require one-half the cultivation that other lands need. Still another farmer, a corn grower, had thirty bushels more corn to the acre. Another says that he has the best garden he ever had.

The immediate result, from the areas managed by the farmers according to the methods recommended by the Commission's experts, is ten dollars an acre of clear profits after the extra labour has been paid for. If one could make that extra ten dollars an acre come from every acre in the country, what an immense help it would be to Canadian agriculture.

Our Chairman said in his annual address to the Commission yesterday, that in the last resort the highest degree of conservation depends on the efficiency of the human unit. What is needed in

agriculture is to have the farms put to the best use now, and to leave them and the farmers and the farmers' families in the best condition for the future. That is conservation. We are striving for that, and meeting with some success. We have 2,245 ardent associates of the Commission. They are great friends of our work because they take part in it. There is nothing in the world that helps a man to do his duty by another man like joining in some common work for the good of both. At the same time everyone wants to do things for himself. So if we are to help others to advance we must get on their level and work with them. What shall it profit Canada to be called the granary of the Empire, or to be the granary of the world, if we lose the soul of a happy and contented rural citizenship? In the rural homes and in the fields, the Conservation Commission is helping to turn the faces of the people towards a better goal, than merely exploiting land for immediate gain. The largest crops of the best quality at the lowest cost and the land clean, more fertile and beautiful because of our care as farmers—that is our hope and ambition and we are making progress towards its practical realization.

The Commission adjourned for lunch.



Agricultural Survey, 1913

BY

F. C. NUNNICK

Agriculturist, Commission of Conservation

DURING the summer of 1913 the Committee on Lands of the Commission of Conservation, conducted agricultural survey work in twenty-nine districts in Canada. Two of these districts had been visited during 1912, but in the other twenty-seven the survey was conducted in 1913 for the first time. Owing to the special nature of the farming in British Columbia, the lack of extensive mixed farming areas and the fact that more districts were visited there during the previous survey than in the other provinces, British Columbia was not included in the survey of 1913. For particulars describing the method of conducting the survey, see page 125.

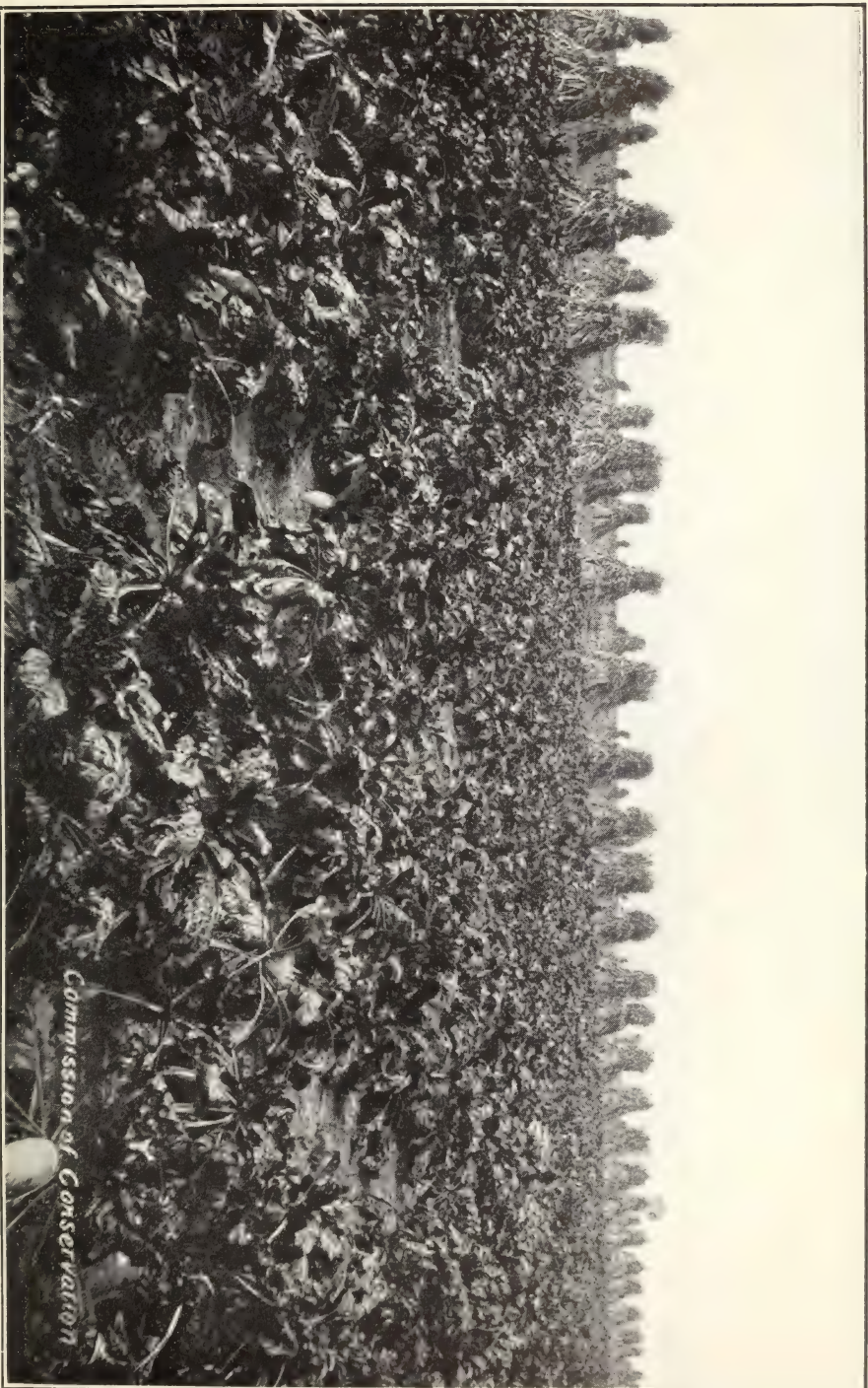
CROPS GROWN, CROP ROTATION, SEED SELECTION AND MANURES

Prince Edward Island

The rotation generally followed, if it can be called "rotation," approaches most closely the old seven year system. The sod is fall ploughed and oats are sown the following spring. The portion of this not used for hoe crop the next year is seeded out to timothy and clover with a second crop of oats. Wheat follows the root crop and is also seeded with clover and timothy, no other grass seed being used. The next year a crop of mixed clover and timothy hay is harvested, followed by a crop of timothy, and then the land is left for several years in pasture. This pasture crop usually becomes very thin before the ground is again broken up.

A considerable amount of grain is sold from the farms for feed, but a few of the more wide-awake farmers are giving more attention to their grain and realizing better prices by selling it for seed. The majority of farmers pay very little attention to the selecting of their grain for seed. They exchange their seed oats and potatoes with some farmer living at a distance, every three or four years. They believe that the grain becomes run out or poorer in quality, when sown continually on the same ground. This no doubt happens when no attention is paid to selecting the seed in order that the best may be kept and used for seed.

Barn-yard manure is the mainstay of Prince Edward Island farming. When situated within reach, this is supplemented by seaweed, kelp or oyster shell mud. The latter contains a large



THE IMPORTANT PART OF A SYSTEMATIC ROTATION OF CROPS
On the average farm the area in hoe crops is far below what it should be. (See Agricultural Survey Tables). Fields like this
should be seen on every farm.

percentage of lime, which seems to have a beneficial effect on the non-calcareous soil of the Island. In very many instances more care should be taken of the barn-yard manure, as sometimes the neglect is almost criminal. Not one farmer of the one hundred visited had a manure cellar—a few have manure sheds. The manure is generally applied altogether to the hoe crop, before planting, and is applied more heavily on a small area than is desirable to obtain good results. As the hoe crop is so limited a great portion of the farm remains unmanured each year.

Nova Scotia In every report from the various districts visited in Nova Scotia, the word comes, "No rotation being followed." In one district three of the farmers were said to be following a rotation on a limited area of land, but not on the whole farm. The majority of the farmers do not understand what is meant by a systematic rotation of crops, much less do they understand the advantages which would accrue from practising a suitable rotation on their farms. Many of the farmers, when asked if a systematic rotation of crops was being followed on their farms, replied in the affirmative, but when they were questioned regarding the rotation it was plainly seen that a rotation was not being followed, and that they did not understand what it really meant.

A few of the farmers save their own timothy seed ; practically none saves their clover seed. Many who are not now saving their own timothy seed could very easily and successfully do so. Speaking generally, the seed grain is purchased. This is often not well cleaned before it is sowed, as the farmers have the idea that it does not need cleaning. As a result, weeds are introduced to the farm in this way.

Many varieties of oats are being sown. In one district seventeen varieties were being sown on less than forty farms. A farmer will hear of some new variety, and will purchase it without knowing anything regarding the percentage of hull, the stiffness of straw, or its general suitability to his land and conditions. The farmer should purchase standard varieties which have been tested and proved to be suitable for his conditions. There are no special precautions taken at harvest time and threshing time to avoid the inclusion of noxious weeds in the grain.

Manure is not cared for as it should be, but the care taken is much better than in Ontario and the Western provinces. Manure sheds or cellars are found on many farms and hogs are allowed to run on top of the manure in most cases. Ontario farmers would

be surprised at the amount of commercial fertilizer used in many districts in Nova Scotia, particularly in the orchard districts. The barn-yard manure is put on the orchards at the rate of about fifteen tons to the acre, while the rest of the farm is often much neglected. It is too much like "putting the eggs all in one basket," and the result is hardship when the apple crop is small or a total failure.

While a few claim to be following a systematic rotation of crops, in one district where thirty-three farms were visited, only one man was found to be really following a systematic rotation. In another district, two men were found to be following something like a real rotation. In some districts, however, where potatoes are being grown quite extensively, it is bringing about conditions which will make it easier to practise a better rotation in time to come. The great trouble here is that the land is not broken up often enough and seeded down to clover but is allowed to lie in pasture for too long a time. This condition obtains almost everywhere over the three Maritime provinces and Quebec.

A few of the farmers save their own timothy seed, but no attention is being paid toward saving clover seed. In many instances Western oats were purchased for seed. These often contain noxious weeds and sometimes the oats have been frosted and the germination is poor. Farmers do not test these seeds for germinating power, consequently their crops are often thin where the Western oats have been sown.

The majority of the farmers have manure sheds, but do not make as good use of them as they might. So often the manure is handled carelessly, the farmers not realizing the necessity for conserving the liquid manure and not paying enough attention to the economical application of the manure produced on the farm.

Quebec (English-speaking) The lack of crop rotations which include some bulky succulent crop like roots or silage is the most serious defect in the farming system of the majority of the farmers visited. Practically none may be said to be following a truly systematic rotation of crops. A few are trying to bring their farms under a more systematic rotation. The rotation does not include the whole cultivated area and is only practised on a portion of the farm. Invariably, the farmers practising even a primitive rotation were found to be the most progressive, and their farms carried more stock per acre of tillable area, than did the farms where no hoe crops were raised. In one instance the addition

of a silo and the growing of ten acres of corn allowed an increase of one hundred per cent in the number of stock kept. On most of the farms visited, conditions were ideal for growing roots but in only a few cases was any attempt being made to remedy the present situation by the growth of this crop.

Very little grain is sold from the farms and what is sold is entirely for seed purposes. In no case was the grain grown under the regulations of the Canadian Seed Growers' Association. Many of the farmers buy what is known as "re-cleaned Western oats." These are frequently bright, clean and heavy, but are often more or less mixed with other grain and weed seeds, and in some seasons have been badly frozen, thus lowering the germination. There is little doubt but that the oats known as "re-cleaned Western oats" are a good grade of feed oats sold as seed.

In the older and more prosperous sections of Quebec the seed is sown with the drill, but in some parts it is sown with the broadcast seeder, and on many farms it is still sown by hand.

In some districts the farmers have fanning mills or can secure the use of one, and clean their seed grain before seeding. In other places the farmers' clubs have bought up-to-date machines for the use of their members. In still other districts, however, the fanning mill is an unknown quantity, many of the farmers never having seen one, much less having used the same for cleaning their seed grain.

The farmers of Quebec realize the value of manure and use all that they produce or can obtain. The manure is handled in a number of ways, all of which have their merits, but many of which are wasteful. Some farmers have concrete manure cellars, and a very few others have covered sheds, while the majority leave the manure in large piles, often under the eaves, saying that they cannot get enough water into the manure to prevent it from "fanging." They do not think of the waste which is going on from leaching and drainage. The manure is used on the hoe-crops, usually being ploughed under in the spring. A few top-dress on the grain stubble for the young seeding.

Grain for two years, followed by hay for a number of years, is the system most generally followed. The amount of clover seed sown per acre is never as large as it should be, running at about three pounds to the acre. Timothy is sown at from 5 lbs. to 12 lbs. per acre. The area in hoe-crop is, in some districts, fairly large on account of corn being grown, which is cured and fed during the winter as stover. In some districts silos are being introduced. The results from the feeding of

St. Polycarpe
(French-speaking)

silage are being watched closely and many farmers are thinking seriously of building silos in the near future. Nearly every farmer sells some grain from his farm each year. This grain is nearly always oats, and is sold to buyers who ship it to the seed markets. Very few sell grain for seed purposes other than exchanging a few bushels with their neighbours. In some districts buckwheat is grown, but not in very large quantities. Very little wheat is grown. Wherever the drill-seeder has been used it has given satisfaction and is increasing in popularity. It is to be hoped that the districts in which the grain is now sown by hand will soon awaken to its advantages.

The question of retaining soil fertility by returning the manure to the land with the least possible loss is one which, as yet, has received very little thought or attention from these farmers. Very few store the manure in a shed. The general custom is to throw it outside regardless of the position or drainage and leave it there until it is convenient to use it. The manure is mostly used on the land intended for hoe crops. It is not spread out to cover as large an area as it should. The amount of fertility returned to the land is small compared to that which is taken from it each year.

Ontario

On most of the farms in the older portions of Ontario we find rotations more nearly approaching what should be followed than in any other province, but even there the farmers do not include a large enough area in hoe crops and the rotations are not arranged systematically, so as to properly cover the whole tillable area of the farm within a reasonable length of time. Too often, a large portion of the farm is left unbroken for a long time. The rotation followed by a few of the best farmers visited is good, but that followed by the average farmer is far from what it should be. The adoption of some means of bringing to the attention of the average farmer, and proving to him the advantages of following a systematic rotation, is what is needed.

Very little grain is sold from the farm for seed purposes. The majority grow their own seed and when it is desired to change—which some farmers do about every three years—it is obtained from a neighbouring farmer. Very little seed is brought in from a distance, and too little attention is paid to grading and selecting the seed grain grown on the home farm. In many instances the best part of the field is kept for seed, but little attention is paid to prevent the inclusion of noxious weeds during threshing.

The manure, in a great majority of cases, is very carelessly handled. Very few have manure sheds or cellars in which to store

the manure to prevent loss. It is produced in rather large quantities, as on most farms a fairly large amount of stock is kept. Artificial manures are not often applied. Manure spreaders are used by many of the farmers, and most of them put the greater portion of the manure on the land that is to be ploughed for hoe-crops. Very little top dressing is done. Most of the farmers seem to realize the value of the farm manure, but the care they give it, is not in proportion to their realization of its worth.

Timiskaming As very little land has, as yet, been cleared, only a few farmers were found in Timiskaming district who practised a systematic rotation of crops. With the exception of hay, however, it is very seldom that one crop is grown on the same land for more than two years in succession.

Very little grain is sold from the farms for seed purposes, the majority of the farmers preferring grain grown in their own districts. They are, as a rule, particular about the seed they sow, only the plumpest grain and that which is free from weeds being sown when it is possible to obtain such. More attention is paid to this phase of the seed question than to the sowing of the best varieties.

Manure is produced in small quantities and no special care is taken to prevent its waste. Many of the farmers favour putting the manure upon the meadows in the fall of the year.

Manitoba The rotation followed in the Pilot Mound and Souris districts is wheat, wheat, oats, barley, summerfallow. Practically no clover is grown. A number of the farmers have commenced growing timothy and report good results. No hoe-crops are grown except a small patch of potatoes for home use. Around Gilbert Plains, the most common rotation is wheat, wheat, oats, barley, timothy, pasture. Very little summerfallowing is done. No red clover is grown.

The majority of the farmers are very careful about their seed grain, particularly the wheat. The wheat intended for seed is usually taken from the crop grown on the summerfallow, which is kept by itself and is well cleaned.

As very little live stock is kept, no attention is paid to the production of manures, and the manure supply is limited. Many of the farmers do not draw the manure to the field until it is thoroughly rotted and as it is left out-of-doors in piles, the rain washes a good deal of the substance out of it. Two farmers, in one district visited, stated that they had been farming there for thirty years and that they had never drawn a single load of manure out on the land.

Saskatchewan In the Lloydminster district a systematic rotation is not followed in any case, and it will likely be some time before anything in this line is attempted. The district is new and the farmers are more concerned about the immediate returns to be received than they are about the system which will eventually be most beneficial to their farms. In the Melfort and Yorkton districts the greater portion of the land is devoted to oat growing. In the Melfort district, ninety per cent of the farmers grow some wheat but it has not proven altogether satisfactory, as the district is subject to early frosts. In the Yorkton district about forty per cent of the farmers are growing wheat, but the acreage devoted to wheat growing is comparatively small. At Melfort, about twenty per cent of the farmers have sown timothy and a few rye grass, ten per cent alfalfa and six per cent red clover. The timothy and rye grass do well and give good yields. Alfalfa has really not been a success so far, owing to the fact that the soil has not been inoculated and hardy varieties have not been sown. Grasses and clovers are not grown to any extent around Yorkton.

As a general rule, farmers do not make a practice of growing grain for sale as seed. Usually, each man sows his own seed. Considerable interest is being taken in the quality of the seed sown, and it may be said that this awakening is not coming a minute too soon. A few of the farmers sow seed from the best portions of their fields, but the majority use the grain from the storage bin. They all clean their grain with the fanning mill before sowing and a few of them put it through the mill two or three times. It must be said that the farmers are careful in this respect.

The use of manure does not enter into the economic side of farming in Saskatchewan. About fifty per cent of the farmers visited make use of the manure, but it is usually drawn out to get it out of the way because they do not wish to burn it. Many of the farmers, however, either burn the manure, or allow it to accumulate for years and do not use it. No care whatever is taken to prevent waste.

Alberta Crop rotation is a more or less vague term to the majority of the farmers visited in Alberta. In practically every case some effort was made to alternate the crops grown, but in not more than a half dozen instances was the rotation based on any carefully thought out plan. The production of grain is the chief aim of these farmers. Timothy and brome grass are being grown in a small way on a number of the farms visited.

The farmers visited do not as a rule make a practice of selling much grain for seed. Seed is changed periodically, one would judge without much design other than to satisfy a more or less indefinite opinion that it should be changed. In nearly every instance the grain is cleaned and generally treated for smut.

The majority of the farmers stated that they used manure. Only two farmers practised drawing the green manure to the fields and spreading it in the winter time. A common practice is to throw it out in heaps wherever convenient, and haul it to the fields whenever time permitted during the summer or fall. In the majority of instances no systematic use is made of the manure. Absolutely no care was taken to prevent waste. On some farms great piles of manure were left in the open to leech ; in one instance a pile was over 10 years old.

WEEDS, INSECTS AND PLANT DISEASES

Maritime Provinces

The following is what the collector for Prince Edward Island has to say regarding weeds and insects :

"Weeds are still on the increase. A few individual farmers are putting up a brave fight but there is no governmental help and no combined effort is being put forth to drive back the invaders. In some neighbourhoods a few careless, neglectful farmers menace all the surrounding farms. Insect pests are pretty well under control with perhaps the exception of the Hessian-fly and joint-worm of wheat and an undetermined borer which has destroyed all fir timber on the Island." In Hants county, Nova Scotia, a weed called 'cadlock,' is obtaining a very vigorous foothold. Few farms are free from it, and it is much dreaded by the farmers. In Lunenburg county, Nova Scotia, couch grass and spurrey are giving much trouble and are bitterly complained of. In Inverness county, Nova Scotia, some fields were seen which had been worked up in the spring time, but as the grain had not been sown and these fields were left in a state of neglect, weeds had grown up and were being left to seed the neighbourhood. This neglect seems criminal and should be prevented. Devil's paint-brush is getting a foothold on some of the farms around Gagetown, New Brunswick. In these and the other districts visited in the Maritime provinces many of the common bad weeds are to be found on the farms.

Quebec

Practically all the noxious weeds and also the less objectionable ones are to be found in the districts visited in Quebec, although some districts are not so badly infested as others. Where the land is somewhat rough and the fields are fenced with zig-zag fences, and where the roadsides

are also rough, weeds grow in great profusion on account of it requiring much hand labour to keep the rough land clean. Many of these undesirable conditions could be avoided if a little time were expended in clearing up the waste places, cleaning out corners of the fields, straightening the fences and narrowing the roadsides.

The orchard and forest tent caterpillars are prevalent and destructive. Many of the sugar-maples and deciduous shade trees have suffered serious injury from the forest tent caterpillar. The potato beetle, which has long been regarded as the most serious insect pest, was almost extinct in Compton county in 1913, a thing unheard of in the last twenty-five years. Smut on the grain is very common and does more damage than the average farmer is aware of. Very few farmers treat their seed grain for smut.

Ontario The farms in nearly every district visited are reported as being badly infested with weeds; sow thistle, wild oats, wild flax, wild buckwheat, rib grass, Canada thistle and couch grass are very common. The weed problem is getting to be a serious one with many farmers, and one that interferes largely with the crops grown and the present methods of farming being practised. Those farmers who follow a systematic short rotation of crops have been able to keep the weeds fairly well in check. On the majority of the farms visited, however, weeds are increasing. The farmers are unable to tell definitely where the weeds come from. In many instances no attention is paid to exterminating new weeds when they first appear on the farm, consequently, by the time the farmer does make an effort to get rid of them they have become so numerous that the process is a difficult and expensive one. The old adage, "a stitch in time saves nine" would be one well worth heeding in connection with the weed problem.

Insect pests are not reported as having done very serious injury in the districts visited this year. The codling moth is present in many of the orchards examined, but as very few farmers take any special care of the orchard and do not expect to derive much revenue from it, the loss from this source is not much felt. In some portions of Ontario as well as in Quebec, the potato beetle did not cause serious trouble during 1913. Oat smut, however, caused considerable loss. In several of the districts visited the farmers stated that they had suffered heavy loss in 1912 from potato rot, but crops of 1913 did not seem to be affected, at the time the collector visited the farms.

In Timiskaming district the farmers are not badly troubled with weeds. Much of the land has only recently been cleared and few weeds have had an opportunity to obtain a foothold. Many of the noxious weeds, however, are finding their way into the district, although not seen in great numbers. There is an excellent opportunity for combined effort to keep them in check if the farmers are only alive to the possibility of doing so.

Insects have not been troublesome as yet. A number of the farmers reported loss from potato rot last year, but little evidence of this was seen this year.

Manitoba

The farmers are careless about weeds during harvesting and threshing, very few taking any precautions whatever, to prevent their distribution. A large number of farmers blame the threshers for distributing and increasing the weeds, more especially those who have stook-threshed. A number of farmers stated that they would not stook-thresh in the future, on this account. Several farmers reported finding patches of sow thistle where the threshing had been done the previous fall. The weed problem is becoming more and more serious each year. Wild oats are the worst in the districts visited, the majority of the farmers stating that they were more numerous than usual and blamed the bad weather conditions during the fall of 1912. Patches of Canada thistle were found on a number of the farms, but, in the Gilbert Plains district, strenuous measures are being used to prevent them spreading. Many farmers complain bitterly of weeds being allowed to mature on adjacent farms and thus infesting their farms. Very few of the weed inspectors are doing their duty. Many of the farmers seem to be well acquainted with the worst weeds and are very anxious to keep their farms as clean as possible, but where there are rented farms in the district the tenant usually works the farm for all it is worth, not paying any attention to weeds, impoverishing the fields, and neglecting to keep the fences and buildings in repair. It would seem that there should be a clause in the leases providing against this wholesale carelessness on the part of tenant farmers. This problem is most serious and should have some careful attention. A combined effort is what is needed to keep the weeds in check.

Saskatchewan

In Melfort and Yorkton districts, ball mustard is the worst weed, and is very bad on the majority of the farms visited. From all accounts, it was introduced in the early days in seed grain, and secured a good foothold before any attempt was made to check it. Now it seems almost impossible

to cope with it. Wild oats and stinkweed are found on almost every farm, but as yet they are not so bad as the ball mustard. They are spreading gradually, and unless a combined effort is put forth immediately, they will cause serious trouble in the near future. Canada thistle also is found on many of the farms. In the majority of cases, the weeds are treated with indifference. In the Lloydminster district weeds are not yet considered seriously. Wild oats, ball mustard and couch grass are possibly the worst. These are spreading rapidly and are not looked upon as the serious enemies which they really are to the farmer.

Insect pests and plant diseases were not found to be causing much trouble. In a few cases cutworms and wire-worms affected garden plots but the loss occasioned was small.

Nearly every farmer treats the seed grain for smut and there was very little evidence of this disease found in the crop.

The weed problem bids fair to be one of the most serious that the farmers of Alberta will have to contend with. As in Saskatchewan, ball mustard is the most common weed at the present time, and the means adopted for its suppression are generally quite inadequate. In the Camrose district every farm visited was infested, and many fields were full of it. The single summerfallow method will not remedy the evil; moreover, the fallowing is often done in such an imperfect manner that other weeds are given a splendid opportunity to develop. In many fields, lambs' quarters is abundant, having gained its hold largely because of the apathy of the farmers, many of whom seem to regard it as more or less harmless and easy to kill. It, however, is not being killed, and while it is not so troublesome as some other weeds, yet it crowds out the grain and requires a good many dollars' worth of binder twine to tie it up along with the grain, as well as much labour to handle in threshing. All of this extra labour causes a loss to the farmers.

The areas allotted to each weed inspector are too large to be covered efficiently at the time when the inspecting should be done, to say nothing of making follow-up visits to see that instructions have been carried out. The farmers complain that the threshing machine men do not clean their machines before moving from one farm to another, and are quite helpless in this matter, as the supply of machines is limited and the threshers are accordingly in a position to disregard this very necessary precaution. The weed question is one that should be grappled with at once in Alberta. It is not yet too late to control these pests, but the situation is steadily and



THE MISERABLE SCRUB

A two-year-old scrub bull, the type too often used on Canadian farms. Good cattle cost no more to raise and when ready for market bring higher prices.



CORNER OF A NEGLECTED ORCHARD IN NEW BRUNSWICK

Note the thick sod, the neglect of pruning and the effects of failing to protect the trees from prevailing winds. Such orchards cannot be profitable.

rapidly assuming alarming proportions, and unless something is done soon to control the weeds, the weeds will control the country.

FUEL, POWER AND WATER SUPPLY

Prince Edward Island

The wood-lot as a source of fuel supply is fast becoming a thing of the past, and it is only a matter of a few years until all the farmers will be burning coal.

Whether or not, wood for fuel is a profitable crop to grow, is a debateable question, and it is hard to persuade the average farmer that he should provide for generations yet unborn by planting a wood-lot. But apart from the economic phase of this question, there is perhaps nothing that gives a country an appearance of more barren desolation than to be utterly destitute of trees.

Gasolene engines and treadmills do the threshing and sawing and might be more often applied to the chores about the house and barn, such as churning, washing, pumping, etc. Three-horse machinery is slowly supplanting the one-horse and two-horse machines for various operations in sowing, cultivating and harvesting.

The water supply in most cases is sufficient, but it is seldom situated as conveniently as it could be. In many instances, it does not require the aid of a chemist or a bacteriologist to determine that it is at least unsafe. Wells dug many years ago, close to the buildings, are nearly always the source of supply. These are not as carefully protected as they should be, and on account of the porous nature of the soil of the Island, seepage from a source of contamination, has little difficulty in finding its way into the well.

Nova Scotia and New Brunswick

On almost all the farms visited in Nova Scotia and New Brunswick there is plenty of wood for fuel for many years to come. Very few farmers burn any coal. Many of them sell cordwood which is shipped away. Very few have set aside a permanent wood-lot, to which they give any attention, or to which they apply any practice, which will maintain the supply on the area set aside. There seems to be wood enough on most farms to last for an indefinite period and there is no anxiety felt in this regard. There is, however, much unnecessary waste going on, the effect of which will no doubt be felt in years to come.

In the orcharding districts of Nova Scotia and New Brunswick, gasolene engines are used for spraying the trees, for threshing and for sawing wood. In these districts many oxen are used for working around the trees. The adoption of wider machinery and three or four horse teams has not as yet taken place on many farms.

Very few of the farmers have water on tap and other modern conveniences in the house. The water supply is abundant in many districts, in the form of springs and brooks, but the general sanitary conditions should be greatly improved around many of the farm homes. The water closet is often too close to the source of the water supply to be safe.

Quebec

In some of the districts visited every farmer had a private wood-lot composed of choice hardwood. In these districts the supply is sufficient for an indefinite period, barring forest fires, and provided care is taken in cutting the yearly supply. The native farmers are very careful in this respect and place a high value on their wood-lots. There is, however, a tendency among the incoming farmers to clear their wood-lots indiscriminately in spite of the fact that in many cases the land cut over is absolutely useless for agricultural purposes. This practice is bringing the newcomers into disrepute, and deserves to be strongly condemned. In almost every instance the farmers in these districts have a liberal supply of wood of good quality for their use, this phase of the home life apparently receiving much attention. In other districts in Quebec the fuel supply is very short. In one district where thirty-four farms were visited, a total of 42 acres of woods was found the greater portion of which was not available for consumption because it was usually young wood or stands of sugar-maple from which only the dead wood was removed. In the districts where the fuel supply is short, coal is brought in for heating purposes during the winter and wood used for cooking. The number of farmers using coal and the amount used per farmer is rapidly increasing. There is little likelihood of any forest planting being done in some of these districts so long as the soil retains its productivity.

The portable gasoline engine is fast gaining in favour in Quebec as a source of power. Nevertheless the old treadmill horse-power is often relied on to furnish power for threshing and wood-sawing. The erection of silos creates a necessity for a stronger and more economical power and the gasoline engine is the most efficient means of filling this demand. Many of the more progressive farmers have the engine installed so that various farm operations can be performed by it. The original investment in this regard is sufficiently large, however, to cause many farmers to hesitate before purchasing one. Very few windmills are to be seen. The scarcity of labour and the renewed activity in draft-horse breeding is bound in a short time to force the farmers into using larger and more efficient farm machinery. Many of the farmers are, at the present time, planning

to equip their farms with machinery that will permit of more work being done per man. Little or no provision is made for the use of power in the work of farm houses.

In some districts there are splendid and easily available water supplies. In such cases, where springs abound, the water is often piped directly to the buildings or can be conveyed there by means of hydraulic rams or pumps. Where conditions are so favourable there is little excuse for not having running water in the farm buildings, but there are many farms that are not thus equipped. The initial cost being seldom great and the saving of labour derived therefrom are features of great importance. In many instances, the water is piped to the yard and with little more expense it might be running into the house and stables, thus giving all city conveniences at the mere cost of installation. In other districts, where the land is flat, lack of a plentiful supply of water is keenly felt. Where such is the case, water is obtained wholly from wells, many of which are very deep, making it hard work to draw the water. In very few cases are shallow wells found that give any degree of satisfaction. Many of the farmers have storage tanks for rain water in the upper storey of the house, and in this way they have soft water on tap for washing purposes. As would be expected on this flat land the sanitary conditions are anything but desirable. The inadequate supply of water, with the poor natural drainage, does not so easily permit of the use of modern sanitary conveniences.

Ontario

In most of the districts visited, the fuel supply is not large, although most of the farmers have wood-lots.

Some are conserving what woods they now have while others are cutting theirs down year by year to get the land for cropping purposes. A few use coal, but wood can be obtained at fairly reasonable prices by those who have no wood-lots of their own. Few farmers are interested in setting aside a definite area as a wood-lot or in the re-forestation of waste land. Quite a number who do not have a wood-lot on the farm where they live have a few acres of land some distance away from which they obtain their fuel supply.

The chief source of power on the farm is the draft-horse. A number of farmers have windmills for pumping water. The majority of the farmers rent a steam-engine and separator for threshing their grain. The engine is also used in cutting corn for filling their silos. A few own gasoline engines for house and barn work.

In the districts visited, the water supply was abundant and in most instances the farm buildings were well laid out so that the water supply is free from contamination. Water is obtained prin-

cipally from wells and usually carried into the house in pails. In some districts water was obtained from springs. Many of the wells, from which water for stock was obtained, are not properly situated and little care is taken to prevent contamination. The wells on the whole, however, are fairly sanitary. Very few of the farmers have bathroom and modern conveniences in their houses.

Timiskaming In Timiskaming district the fuel supply is abundant, but often uncertain owing to the frequency of forest fires. Very little effort has been made toward preserving a supply of timber for fuel and many will be without a wood supply on their farm within a few years, in spite of the fact that there is a large amount of wood in the district.

The horse is the chief source of power for the settler. A few have excellent engines that are used for cutting wood and lumber and for threshing grain. No windmills were seen in this section.

The water supply was found to be abundant. A number of the farmers obtain their supply of water from flowing springs. Some farmers, however, are still using water from shallow wells which are not well situated with regard to surface drainage. A good supply of water can be had by drilling from 50 to 100 feet in the rock.

Manitoba In the Pilot Mound and Souris districts no wood is to be found, and the majority of the farmers burn coal. Any wood that is used has, of course, to be shipped in. In the Gilbert Plains district wood is the chief fuel. At one time the district was covered with small bluffs, but these are being rapidly cleared away and the supply of wood on the farms is small. As this district is near the Riding Mountain Forest reserve, wood can be obtained with very little trouble. No planting has been done with the exception of a few trees around the buildings for wind-breaks. In the Pilot Mound and Gilbert Plains districts the horse is still the mainstay on the farm as the source of power. The majority of the farmers visited in Manitoba have small gasoline engines which are used for pumping water and for crushing grain.

In the Souris district the water supply was very unsatisfactory, being so salty that it could not be used for the house. Many of the farmers have to draw water from a distance. Throughout the Pilot Mound and the Gilbert Plains districts the water is of good quality and easy to obtain, no trouble being reported by any of the farmers in these districts. More attention, however, should be paid to the situation of the wells, some being very close to the stables and receiving the drainage from them. Very few have hard water on

tap in the house, but the majority have soft water cisterns in the basement.

Saskatchewan In the majority of cases in the districts visited in Saskatchewan the fuel consists of both coal and wood. In the Melfort district more than half the farmers use wood entirely as fuel. In the Yorkton and Lloydminster districts coal is used as winter fuel and what wood is obtainable is used in the summer time. In no case was a definite area set aside and cared for as a wood-lot. There is little doubt but that it might be a profitable thing to do, but the farmers have so many other problems to solve that this, as yet, has been given very little attention. On a number of the farms maple, ash and poplar trees have been planted as wind-breaks, but on many of the farms these are not as thrifty and as satisfactory as the farmers would like to see them.

In all the districts visited, horses furnish most of the power for the farm work. A few farmers in the Lloydminster district have large steam or gasoline engines for ploughing and threshing, but the percentage is small as very few of the farms are large enough to warrant their use. On some of the farms, small threshing machines operated by gasoline engines are in use, and in most cases have given satisfaction. The use of these small machines, intended for home use only, will, in some measure, lessen the spread of weed seeds and in this way will be of considerable advantage both to the individual farmer and to the neighbourhood.

In the Melfort district, the water is distinctly alkaline, and about 90 per cent of the farmers use rain water for household purposes, many of the houses being provided with metal roofs in order to avoid dirt of any kind lodging on them. Many of the farmers store ice for use in cooling water. In the Yorkton district, the water supply for the most part, is good and, as a rule, plentiful. Little attention has been paid to the situation of the well, from a sanitary point of view. It has been dug at a point likely to yield a good supply of water, regardless of its proximity to the outbuildings.

In the Lloydminster district, the problem of getting a sufficient supply of water is a serious one for many of the farmers, some of them having to haul the water one or two miles for both the stock and for house use. Good water may be obtained by drilling to a depth of 150 to 200 feet, but many of them have not the capital, as yet, to undertake this work. The difficulty of getting water has prevented many of the farmers from going more extensively into cattle and hog-raising.

Alberta

In the Camrose and Innisfail districts there are very few farms that are not provided with several acres of poplar woodland. At Camrose, lignite coal of good quality may be had with very little trouble. Coal is easily obtained at Innisfail, although not mined in the immediate neighbourhood. At De Winton, coal is easily obtained, and a number of farmers make it their only fuel. On a few of the farms in this district some wood was found.

Horse-power is used almost altogether in performing field work. In the Camrose district tractors of any type cannot be used to any advantage until the poplar and willow areas are cleared up. At Innisfail the land is too rolling and broken by bluffs to permit of the use of tractors. In all the districts visited, many farmers were found to be using gasolene engines for house and barn work. Quite a number of windmills were seen.

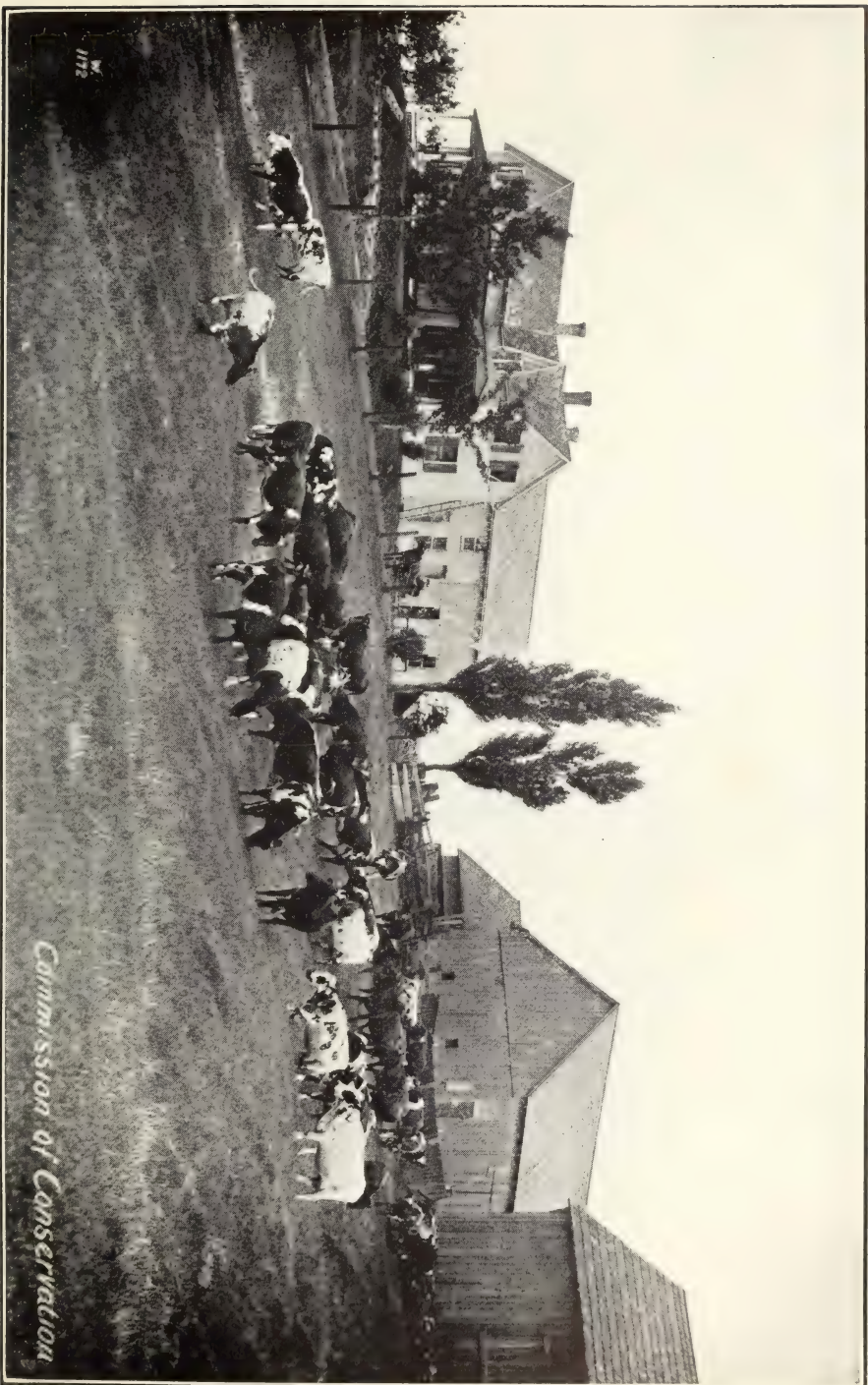
In all the districts visited, the water supply was found to be ample and of good quality. The sanitary conditions in the Camrose district were found to be fair, but in some instances the manure piles were too near the well to insure freedom from contamination. On one farm in the Innisfail district the well was under the house, and on several farms there was not a water closet of any kind. In the De Winton district, drilled wells are quite common and are usually from 75 to 100 feet deep. There are also a number of small streams in the district which supply water for stock. Sanitary conditions were found to be fairly satisfactory.

LIVE STOCK, LABOUR AND MISCELLANEOUS**Prince Edward
Island**

The live stock kept on most of the farms visited is a credit to neither the farms or farmers. Beef and dairy bulls are used with little discrimination and the careless crossing of pure breds has produced a stock of cattle that are no better than scrubs. Heavy horses are the best class of stock kept, but too much attention has been given to the raising of general purpose horses, which, though handy for farm work, are not good for the export market.

In many instances, serious hardship is brought about by the scarcity of labour. This might be greatly alleviated by adopting a more systematic plan of farming, by using machinery of greater capacity and adopting more definite hours of labour.

Farming, in the true sense of the word, that is, as opposed to soil robbing, is not considered as a business proposition. It is doubtful if any of the farms visited were paying a dividend on the capital invested, if the time of the farmer, his wife and family is



A FINE HERD OF CATTLE ON A FARM IN EASTERN CANADA

There is money in cattle—money for dairy products, for beef, and most of all for next year's crop, provided every particle of manure is saved and applied to the land.

considered to be worth even ordinary labourer's wages. Many of the farms have become impoverished and unless a radical change takes place in the farming methods it is only a matter of a few years until they will cease to support their owners.

Farmers, as a rule, do not move about enough. When they do take a holiday, it is to visit some distant city. They might often obtain more useful hints by visiting and observing the methods of their more successful neighbours. Incessant, plodding toil soon stunts a man's imagination and capabilities, and one can hardly wonder at the longing of the younger generation for a less exacting and more exciting mode of living. The business side of farming must receive more attention. Shorter and more definite hours of labour and being given a personal interest in the work, would go a long way towards keeping the young folk on the land.

**Nova Scotia and
New Brunswick** In some districts in Nova Scotia, there appears to be a general awakening in regard to the benefits to be derived from improving the live stock on the farm and the agricultural societies have been doing good work in purchasing pure bred sires for the use of the members of the societies. In the orcharding districts many are neglecting their live stock for their orcharding and few are making their live stock keep pace with their orchards. In other districts conditions are yet very much in the rough, as little attention is paid to the improving of either the dairy or beef cattle.

In the districts visited in New Brunswick there was found to be much room for improvement in all classes of live stock. Horses, while good for farm work, are not of a quality and type to bring good prices when they are put up for sale. Many cows were seen on the farms visited that would not pay their board.

In most of the districts visited in New Brunswick and Nova Scotia good farm labour was found to be scarce, but this difficulty is overcome to some extent by the farmers exchanging work. It was also noticed that the farmers who pay promptly and who use their help properly, find little difficulty in getting all the men they want. There is a general complaint that a good many of the men brought into the country do not know how to perform the kind of farm labour that is required of them. Where men can be hired by the year so that steady employment is assured, less difficulty is experienced in obtaining reliable farm help. In all districts visited in these two provinces mixed farming was practised. In Hants county, Nova Scotia, however, the farmers look mainly to their orchards to pay their bills. Hay is also a very important crop, some men cutting as high as 200 tons in one season.

Many of the farmers met with are extremely anxious for information with respect to agriculture. The people generally are sociable, enthusiastic and anxious to improve their prospects. If an improvement could be brought about in the quality of the farm products, there is no doubt but that the demand and the price for the same would be considerably increased.

Quebec In the English speaking districts of Quebec, where the farms are large, the natural pasturage good, labour scarce and the farms a long way from a milk market, it was found that beef cattle raising is the most profitable branch of the live stock business. There is, however, a decided lack of system and science in breeding operations there. The course followed seems to be to make as many harsh outside crosses as possible. Very few of the farmers are breeding pure-bred stock, but those who are, appear to be the most successful farmers.

In the districts where the farmers are situated so that dairy products may be advantageously disposed of some very good dairy herds are to be found, but here again the lack of thought and judgment in breeding is very lamentable. Many of the farmers have not sufficient stock, although they are carrying a sufficient number of cattle to dispose of the feed on the farm, but the right kind of feed is not produced to maintain the size of herds which should be found on the farms.

The draft-horse breeding business has received a great impetus lately, and has taken on a new lease of life. Many fine imported stallions have been placed at service in many districts, the agricultural societies doing much to help in this work.

Although conditions are very favourable to sheep raising very few farmers keep sheep at all, and those who do, do not keep many. A number of reasons are given for this, such as scarcity of labour, danger from dogs, and the low price of mutton which obtained a few years ago, caused many to give up sheep raising as an unprofitable undertaking. On many of the farms visited, the fences were unsuitable for keeping sheep, and in reality this is the patent factor which prevents the farmer from engaging in this branch of farm work, as the dog problem is often quite imaginary and the labour involved is slight.

Poultry has not received much attention, other than enough to supply the local demand. This year, however, Macdonald College distributed many settings of plymouth rock eggs among the school children of the province and demonstration poultry houses are being



ONE WAY OF OVERCOMING SCARCITY OF LABOUR

One man and four horses rolling and harrowing twenty-two acres a day. Machinery of greater capacity will help to solve the labour problem.



AN OVERMANNED OUTFIT

Two men and an ox, cultivating about three acres a day. A striking waste of labour.

erected at several points. The effect of this extension work cannot help but be a stimulus to the poultry industry.

The labour question is of the utmost economic importance to the agricultural prosperity of the eastern provinces. The questions of good roads, rural mail delivery, etc., are overshadowed by the labour question. A great many of the failings and drawbacks to farming in Quebec may be directly or indirectly accredited to the scarcity of reliable, skilled farm help at all seasons of the year. The lure of the West and the opportunities offered in other industries have had their share in depopulating many sections of the province of its younger generation, as well as keeping the better class of immigrants from coming in. In many cases, the farms are run by the parents of the family, the children having sought other walks of life. No doubt this scarcity of labour could be overcome to some extent if the farmers would give employment by the year and provide their helpers with suitable and comfortable houses in which to live. Married men usually give best satisfaction in the way of farm help. It must be admitted that working conditions are not always ideal, the hours are long and Sunday work is disagreeable to the average farm hand. While there is no denying the justice of the farmers' claims that one of its great drawbacks is the scarcity of labour, yet a great deal of hand labour could be eliminated by using larger implements, improving the general lay-out of the farms and planning the work on the farm so that it could be conducted in a systematic manner.

In a number of cases too many horses are kept to be profitable, while the number of cattle kept, per hundred acres, is seldom up to the capacity of the farms. Perhaps one of the most striking facts disclosed by the survey in the districts where the English predominate is the scarcity of children and young people found on the farms, and the advanced age of most of the farmers.

What has been said regarding the English-speaking districts visited may well be said of the French-speaking districts, with the exception, of course, that there are more young people found on the farms. However, in the districts close to large towns or cities the scarcity of labour is keenly felt. The irregularity in the demand for farm help makes it difficult to obtain skilled farm hands when they are needed. This condition is most aggravated at the haying season, when, as a rule, labour is scarce everywhere. Too much hay and grain are sold off the farms and not enough stock is kept. Wasteful handling of the manure is a serious menace to the profitable continuation of the present system of farming, as is also the neglect of noxious weeds along roadsides, fences and ditches. The need for

better machinery and better cultural methods is plainly visible in almost all sections visited.

Ontario The live stock seen in the districts visited was in good condition, in almost every instance. The farmers in some districts were specializing in beef cattle, while in others dairy breeds predominated. There seems to be an awakening of interest in the breeding and production of heavy draft-horses and many good specimens of the draft breeds were to be seen. Many of the farmers also have horses of the lighter breeds for drivers. A comparatively small number of hogs was seen on the farms visited this year. Only small numbers of sheep are kept, although the conditions would seem favourable for sheep raising. In many districts there are large tracts of land from which very little is being realized at the present time, and which might be very profitably utilized for the pasturing of sheep.

There is a great scarcity of labourers throughout the sections visited, to remedy which, a great deal can and must be done by the farmer himself. He should plan a system of farming so that he can employ his helpers by the year. At the same time, he should use more labour-saving machinery. A great many different suggestions are made by the farmers, regarding the solution of the labour problem, a number of which are not very practicable. Some of the suggestions, however, are well worth considering. One man suggested the establishing of Governmental Labour Bureaus in the towns, so that the farmer and labourer could be brought more easily together. It seems to be the impression that there are men in the country, if there could be some way devised for finding them and getting them on the land. Nearly all the farmers state that the helpers obtained from local sources are more efficient and more reliable than those brought from a distance. Farmers are ready to admit that the "home grown" farm helpers are the best, but many of these same farmers are doing very little towards making their home attractive enough to keep their boys on the farm.

There are many drawbacks to the continuation of the present system of farming, but many farmers find it very hard to describe them. They think there is something seriously wrong somewhere. They are not satisfied with the money they are making for the amount of work they do. It is a common complaint that small quantities of produce cannot be marketed at a profit, and that the farmer cannot obtain a higher price in the local market for a good article than for an inferior one. The farmers in the districts visited do not seem to take the marketing business enough into their own hands. The marketing end of the farm operations should

receive more attention by the farmers than it does at the present time.

In Ontario, as well as in Quebec, the fact was very noticeable that a large percentage of farmers were old men, or men past the prime of life.

In the Timiskaming district only a small number of cattle were found on the average farm, as the farmers have only a small amount of cleared land on which to grow feed. A few heavy draft-horses are being raised, but very few of the lighter breeds are to be seen. Just enough hogs are raised to supply the home demand for meats. The price of labour makes the hiring of outside help almost beyond the reach of the ordinary farmer, and there is, consequently, a scarcity of labourers on the farm.

The growing season is short, with frequent early frosts, which are a serious drawback to profitable farming. A number of the farmers work in the mines or elsewhere for a portion of the time, to help make a living for themselves and their families, while they are clearing the land. General mixed farming only is carried on. The soil in this district is a very fertile clay and clay loam. Cereal grains grow and mature well when not injured by early frosts. Potatoes, roots and clover do well. The district seems favourably adapted to the growing of clover for seed.

Manitoba In the Pilot Mound and Souris districts very little live stock is raised. The majority of the farmers keep only enough cows to supply the house with milk and butter. A number of years ago this was not the case, as large herds of cattle were kept in the Pilot Mound district, but on account of the low prices obtaining at that time, many of the farmers went out of stock. A number of the farmers expressed their intention of again going into cattle raising. Only one flock of sheep was reported. Around Gilbert Plains some fairly large herds of cattle were found, but on the most of the farms the grade of cattle is very poor. Very little attention is paid to breeding operations and immature scrub bulls are often used. Nearly all the farmers here sell some hogs each year.

The labour conditions in the districts visited in Manitoba are not very satisfactory. Great difficulty is experienced in obtaining house help and outside help in harvest time. Some have tried sending to England and Scotland for house help, but found difficulty in keeping them for any length of time, as they either married or preferred to work in town.

In regard to the harvest help problem, the one remedy seems to be in an altered system of farming, where more stock will be raised

and less grain grown. Under such conditions the farms would not require so much extra help in harvest time and the help could be profitably employed during the whole year. Nearly all the farmers visited agree, that with the increase of weeds and the wearing out of the land, it will be necessary to raise more stock in the future, thus increasing the supply of manure to keep up the fertility of the soil and by growing less grain, to keep the weeds in check.

One very noticeable feature brought out in the survey in Manitoba was the great difference existing between the surroundings of some homes and those of others. Some houses are surrounded by fine groves of trees, nice lawns, beautiful flowers and shrubs, splendid gardens containing all kinds of vegetables and small fruits, while others are simply dropped on the prairies with not a tree in sight, the house surrounded by long grass and weeds instead of flowers, and with only a small patch of potatoes for a garden. There seems to be such a lack of attention in many cases given to the home surroundings. It is not because the farmer cannot have a garden or cannot do better, but it is because he is indifferent and is not doing as well as he knows how to do.

Saskatchewan The Melfort district is well adapted for stock raising, as the country is for the most part well watered and both natural and cultivated grasses grow well. The average number of stock kept by the farmers in this district is thirty-five. A few keep only one or two milch cows, but quite a number have from 40 to 60 head of fattening cattle. Hogs are quite in favour here and a good many have from 8 to 10 brood sows. The general opinion seems to be that stock raising is the best thing for this district and the majority of farmers are getting more stock from year to year.

The Yorkton district, in the early days, was a cattle country, but most of the farmers gave up raising cattle during the low prices in the '90's. The conditions are favourable here for stock raising, but very little stock is kept at present. The average number of cattle owned per farm is about ten. The sentiment in this district is becoming more in favour of stock raising. If the farmers could be assured that they would get good prices for some time to come, they would undoubtedly launch out more extensively into this branch of farming. Hog raising has not come generally into favour in this district. As yet, there are very few sheep in the district as the farmers claim it is impossible to protect them from the ravages of wolves.

In the Lloydminster district the stock is of fair quality but very little attention is being paid as yet to grading up the herds. This

will likely come in time, however. The newcomers are gradually increasing their herds and the number of cattle kept per farm is in the neighbourhood of eighteen. The general idea here, is that the district is better adapted for stock raising than for grain-growing, and a large increase in the number of stock kept per farm may be looked for in the near future. This district is not famous for its horses. They are, for the most part, common scrubs ; very few really good brood mares are to be found, and, as a general rule, the horses are too light to do farm work to good advantage.

There seems to be little difficulty in obtaining farm help in the districts visited except at harvest time. Where men are hired by the year less difficulty is experienced in obtaining the help required.

The drawbacks indicated by many of the farmers were such as did not come under the province of the Commission. Many of them cited the high freight rates which makes the cost of marketing so high that the margin of profit is small, being barely sufficient for a living. Others mentioned the high rate of interest charged by the banks, making it almost impossible to obtain money to make needed improvements. This is a very vexed question, because there is the danger that some of them would abuse the privilege if easy rates on short loans were to be given.

Live stock conditions around Camrose were found to be fairly satisfactory. There are some herds of pure bred cattle in the district, although those visited were small. The most of the stock seen were grades, the horses are usually poor, but a number of good general purpose horses are to be found on some of the farms. Sheep raising is unpopular because of coyotes.

The Red Deer country is well known for the excellence of the live stock produced there. Pure bred Shorthorns seem to be the favorite, with Holsteins, grade Ayrshires and Polled Angus well in the lead. Almost every farmer keeps from six to forty milch cows. There are not many imported stallions or brood mares in the district. Very few of the farmers are taking much interest in hog raising.

Several of the farmers visited in the De Winton district are engaged in raising Clydesdale horses. Many good horses were seen on a number of farms and the old time scrub range horse is being steadily displaced. Of cattle, the Shorthorn is easily the favorite. There are not many sheep in this district and hogs are not raised in very large numbers, as the Calgary hog market seems to have been too uncertain during the past few years.

The reports concerning labour conditions were very variable, and the means suggested for ameliorating labour scarcity, where it

existed, usually showed that only the most casual thought had been given to the problem. In the Camrose district 22 out of the 34 farmers visited, stated that so far as they were concerned labour was plentiful enough, while the remaining 12 stated that they had difficulty in getting men for the busy season. Many of the farmers, however, admitted that it was very difficult to get good stock-men and milkers. In many instances the home surroundings were such as to repel competent labour.

Very few complaints were heard regarding help with the house work on the farms. This is probably due, to some extent at least, to the thoughtlessness of the farmer and should not be considered as being an indication that such help is always available.

There was much complaint in the De Winton district regarding the unsatisfactory market conditions. There seems to be, in most of the districts visited, much ignorance regarding business methods and the farmers are suspicious, not only of outside buyers, but of their fellow farmers. This is a regrettable state of affairs, as co-operation is based essentially on mutual trust. Other drawbacks mentioned in the various districts were high freight rates and the lack of agricultural credit.

Ownership conditions have a fixed and important bearing on farm life and work. In the district around Camrose there are a great many vacant farms owned by non-resident speculators. A few have also been abandoned either by homesteaders or by subsequent owners. The latter class of farms are usually a serious menace on account of the weeds that grow on and spread from them. This condition of vacant farms is having an ill effect on the social situation in the community. Schools are often poorly attended and the settlers live too far apart to communicate with each other as freely as could be desired. There are, too, in a number of districts in Alberta, many tenant farmers and these are almost without exception little else than soil miners.

The tables which follow give the detailed figures of the survey:

Agricultural Survey Statistics, 1913

I. AREAS

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
No. of farms.....	150	95	100	200	200	100	100	100
Acreage surveyed.....	32,483	10,684	25,547	33,363	29,320	40,725	38,840	44,829
Average size of farm....	216	112	255	166	146	407	388	448
Tillable acreage.....	8,255	8,369	8,448	19,798	18,946	39,523	34,305	38,605
Per cent tillable.....	26	78	33	60	64	97	88	88
Woods (acres).....	14,219	1,732	14,548	6,746	5,715	355	885	2,969
Per cent in woods.....	43	16	57	20	19	.8	2	6
Acreage in crops.....	8,132	6,653	8,328	15,362	15,519	23,170	21,262	12,476
Per cent in crops.....	25	62	32	46	52	69	52	25
Grain (acres).....	1,371	1,960	1,112	4,157	9,073	26,155	20,929	9,822
Per cent in grain.....	16	18	13	27	58	93	98	78
Hoe crops (acres).....	392	302	507	598	989	56	92	55
Per cent in hoe crops...	4	4	6	4	6	.2	.4	.4
Hay and pasture (acres)...	6,424	4,281	6,694	14,064	7,879	5,335	641	18,418
Per cent, hay and pasture	20	4	26	42	26	13	1	39
Summerfallow (acres)...	30	...	...	...	801	6,707	3,943	2,445
Per cent in sum'fallow..	.009	...	...	...	2	16	10	5

II. ROTATION OF CROPS

(Figures given are in percentage of number of farms)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Systematic rotation....	18	13	18	19	56	70	63	53

III. SELECTION OF SEED

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Using seed grain from own farm..	60	72	74	69	80	76	86	79
Systematically selecting seed....	3	..	7	.5	2	1	1	5
Keeping best part of field for seed	51	31	75	53	51	79	42	82
Cleaning seed grain.....	64	86	82	78	97	100	100	99
Cleaning seed grain with fanning mill.....	51	83	77	78	96	100	100	99
Cleaning seed grain by other means.....	13	..	4	..	2	..	..	..
Treating seed grain for smut....	4	11	..	1.5	24	100	93	88

IV. PRODUCTION OF TIMOTHY AND CLOVER SEED

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Saving own timothy seed.....	28	68	3	48	45	16	1	28
Saving own clover seed.....	3	27	..	4	48	..	..	..

V. CLOVER AND ALFALFA

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Acreage seeded to clover	779	974	570	2,717	3,488	25	22	..
Per cent of grain sown seeded to clover	57	49	51	763	37	.09	.1	..
Av'g. lbs. per acre sown of red clover	6	2	6	3	6	12	10	..
Av'g lbs. per acre sown of alsike	3	2	2	2	5	3	..	9
Av'g. lbs. per acre sown of timothy	11	8	11	8	5	5	9	6
Per cent growing alfalfa	2	..	2	5	20	8	9	13
Acreage of alfalfa grown	2	..	..	10	186	13	19	58
Per cent of total crops in alfalfa . . . . .	.003	..	..	.07	1	.04	.08	.4

VI. COMPARISON OF YIELD OF CROPS NOW WITH TEN AND TWENTY YEARS AGO

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
WITH 10 YEARS AGO :								
Reporting same yield	24	29	40	..	31	21	37	36
Reporting increased yield	61	23	36	51	21	4	1	20
Average per cent of increase	16	19	26	27	12	13	10	16
Reporting decreased yield	5	31	8	10	22	57	7	8
Average per cent of decrease	18	17	16	16	22	19	6	15
WITH 20 YEARS AGO :								
Reporting same yield	6	1	31	3	15	1	..	1
Reporting increased yield	38	9	31	36	5	1	..	4
Average per cent of increase	22	20	35	46	12	15	..	22
Reporting decreased yield	5	29	9	7	8	43	..	1
Average per cent of decrease	23	27	13	18	18	34	..	..

VII. NAMES OF VARIETIES

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Knowing names of varieties of grain sown	66	95	63	61	93	95	88	82

VIII. MANURE

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Using farm manure	100	99	99	96	99	97	58	89
Using chemical fertilizer	92	9	70	46	1	..	..	..
No care to prevent waste	45	84	31	67	93	100	100	100
Having manure shed	34	15	65	26	6	..	..	..
Having manure cellar	21	..	4	7	..	..	..	..
Using manure spreader	26	21	22	10	67	29	2	2

IX. DISPOSAL OF HAY AND GRAIN CROPS

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Tons of hay sold per farm.	10	2	6	18	9	2	2	8
Tons of hay fed per farm.	41	15	50	47	27	24	31	65
Bus. of grain sold per farm.	23	154	11	118	481	5,083	6,583	1,730
Bus. of grain fed per farm.	329	159	365	377	709	1,660	1,623	1,516
Per cent burning the straw.	0	..	..	0	..	75	68	18
Per cent using straw for feed and bedding.	100	90	100	100	98	95	97	97
Per cent selling straw. ....	..	..	..	1	1	..	..	1

X. DISPOSAL OF ROOT CROPS

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Av'g bus. potatoes sold per farm	137	222	454	58	43	10	39	16
Av'g bus. other roots sold per farm.....	25	..	44	13	40	..	..	..
Av'g bus. roots fed per farm...	443	74	774	331	612	10	5	16

XI. LIVE STOCK

(Figures given as average number per 100 acres)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Cows.....	3	3	3	6	4	1	1	1
Other cattle.....	5	5	5	9	8	2	4	5
Horses.....	1	2	1	2	3	2	2	2
Colts.....	.5	.5	.3	.7	1	.9	1	1
Sheep.....	4	6	2	3	3	.3	.3	.4
Brood sows.....	.3	.6	.5	.5	.8	.6	1	.7
Swine fattened annually.....	2	4	2	4	9	5	6	5
Chickens.....	15	52	12	23	44	28	23	25

XII. BRANCHES SPECIALIZED IN

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Specializing in mixed farming . .	85	88	98	64	90	38	17	68
Specializing in dairying	15	1	..	36	5	..	3	8
Specializing in grain . . . . .	..	..	..	..	..	41	80	20

XIII. FARM LABOUR

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Number in family.....	5	4	5	6	5	4	3	4
Number in family over 14 years of age.....	4	3	4	3	3	3	2	3
Number of days labour spent per 100 ac., by men.....	245	282	206	233	352	112	110	86
Number of days labour spent per 100 ac., by women.....	223	215	184	218	282	90	96	71
Number of days labour spent per 100 ac., by boys.....	21	11	14	102	4	..	3	20
Number of days labour spent per 100 ac., by girls.....	16	10	10	66	3	..	2	13
Number of days labour paid outside help per 100 acres.....	116	51	76	91	133	84	81	44
Total number of days labour spent per 100 ac., in year.....	621	574	487	702	769	293	290	236
Per cent reporting scarcity of labour.....	65	75	59	66	86	21	32	29
Per cent reporting scarcity of men.....	61	71	55	66	86	21	17	25
Per cent reporting scarcity of domestic help.....	15	22	26	18	25	..	15	8

XIV. FUEL SUPPLY

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Using wood.....	81	81	98	81	64	50	47	30
Using coal.....	2	4	..	..	4	40	5	24
Using coal and wood.....	17	10	1	16	32	10	48	46
Using gas.....	..	..	..	3	..	..	..	..
Average No. of years wood supply will last on farms having wood lots.....	30	23	70	22	14	..	16	11
Having indefinite supply.....	71	21	77	62	23	1	4	44
Having definite wood area set aside.....	45	25	37	73	29	0	23	18
Having done planting.....	..	..	..	..	3	72	24	36
Average No. of trees planted.....	..	..	..	..	925	885	1,021	596
Successful in planting.....	..	..	..	..	2	98	100	52
Failing in planting.....	..	..	..	..	1	..	..	4

XV. WATER SUPPLY FOR THE HOUSE

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Obtaining water for house from wells.....	78	89	44	48	95	83	75	90
Obtaining water for house from springs.....	20	3	56	44	4	1	0	9
Obtaining water for house from streams.....	2	2	..	8	0	3	6	2
Obtaining water for house from rain water.....	..	..	..	..	..	..	19	..
Having source of water supply within 10 ft. of, or at or in buildings.....	13	24	23	2	17	23	5	1
over 10 ft. and up to 25.....	8	30	13	5	26	18	6	4
over 25 and up to 50 ft.....	16	22	9	8	22	26	14	9
over 50 ft. and up to 100.....	13	7	7	10	13	11	15	29
over 100 ft. and up to 200.....	14	5	13	14	8	8	12	34
over 200 ft. and up to 300.....	11	5	3	8	4	2	11	8
over 300 ft. and up to 500.....	6	0	4	12	5	5	1	8
over 500 ft.....	8	3	16	33	5	7	4	7

XVI. DISTANCE OF SOURCE OF WATER SUPPLY FROM BUILDINGS OR OTHER SOURCES OF CONTAMINATION

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Having w.c. within 25 ft. of house water supply.....	1	1	..	9	2	1	5	0
Having w.c. over 25 ft. up to 50 ft.....	5	4	..	29	10	12	18	0
Having w.c. over 50 ft. up to 100 ft.....	14	9	..	6	42	35	13	24
Having w.c. over 100 ft.....	19	36	..	27	35	39	33	66
Disposing of sewage in pit under privy.....	98	75	89	82	..	99	99	100
Obtaining water for stock from well.....	46	85	34	49	77	83	38	66
Obtaining water for stock from spring or stream.....	49	11	61	7	20	17	14	33
Obtaining water for stock from pond or other source.....	5	3	1	44	3	0	7	1
Source within 10 ft. of or in b'ld'gs. over 10 and up to 25.....	6	18	8	14	10	26	2	3
over 25 and up to 50.....	4	25	7	8	5	12	9	2
over 50 and up to 100.....	16	24	16	13	11	20	11	9
over 100.....	15	7	2	11	32	19	20	21
	54	15	41	42	42	19	44	60

XVII.

(Figures given represent the

	NOVA SCOTIA						PRINCE EDWARD ISLAND						NEW BRUNSWICK								
	l	a	b	c	n	i	d	l	a	b	c	n	i	d	l	a	b	c	n	i	d
Ball Mustard																					
Barnyard Grass															2	2					
Bindweed																					
Bladder Campion								1	1												
Blue Burr	3	3																			
Blueweed	1	1																			
Canada Thistle	71	70	1					39	38	1			2	1	45	45					
Chickweed	6	6						43	28	15		12	8		12	12					
Chicory																					
Couch Grass	53	51	2				2	27	24	3			1	1	87	79	8				
Golden Rod	29	29				1		24	42	0			1	1	17	17					
Green Foxtail	2	2																			
King Devil																					
Lady's Thumb	2	2						5	5												
Lamb's Quarters	13	13						5	5						6	6					
Mayweed								24	21	3			5		1	1					
Milkweed	3	3																			
Wild Mustard	21	20	1				1	3	3						8	8					
Night Fl., Catchfly																					
Orange Hawkweed								4	4						18	16	2			1	
Ox-eye Daisy	50	49	1				1	43	38	5		21	2								
Pepper Grass																					
Pigweed	4	4						18		16	2	17			23	23					
Ragweed															1	1					
Rib Grass																					
Shepherd's Purse	1	1						4	4						1	1					
Sow Thistle	3	3						33	31	2			3	4	2	2					
Stinkweed																					
Tumbling Mustard																					
Wild Barley																					
Wild Buckwheat	1							8	7	1			2		1	1					
Wild Carrot																					
Wild Flax																					
Wild Oats																					
Yarrow	8	8						31	26	5			214		2	2					

KEY TO LETTERS :

- Column (l) gives total percentage of farmers reporting the weed.
 Column (a) gives percentage reporting it as scarce on farm.
 Column (b) gives percentage reporting it as numerous on farm.
 Column (c) gives percentage reporting it as very bad on farm.
 Column (n) gives percentage reporting it as new to farm in last five years.
 Column (i) gives percentage reporting it as increasing.
 Column (d) gives percentage reporting it as decreasing.

percentages of number of farms)

QUEBEC						ONTARIO						MANITOBA						SASKATCHEWAN						ALBERTA										
l	a	b	c	n	i	d	l	a	b	c	n	i	d	l	a	b	c	n	i	d	l	a	b	c	n	i	d	l	a	b	c	n	i	d
4	4	.	.	.	1	2	10	10	.	.	.	.	.	86	26	60	.	.	.	12	91	41	28	22	156	.	74	44	39	13	118	40
3	3	.	.	.	1	2	13	13	.	.	.	1	1	2	2	.	.	.	.	.	13	11	2	.	1	.	8	7	1	.	.	.
1	1	1	.	.	1	2	1	.	1	.	.	.	.	15	9	5	1	6	1	.	45	24	20	1	6	.	3	3	.	.	1	1
8	6	2	.	.	3	4	25	23	2	1	15	9	5	1	6	1	.	45	24	20	1	6	.	3	3	.	.	1	1	
2	2	.	.	.	2	1	8	5	2	1	1	1	.	.	1	.	1	1	
63	52	11	1	.	6	41	83	33	45	5	.	4	10	78	44	21	3	31	4	.	17	14	3	.	1	7	15	14	1	.	2	.	5	
14	8	5	1	.	6	6	2	1	1	1	
20	15	5	.	.	8	7	2	2	
47	23	24	1	.	32	15	59	29	22	8	.	10	18	4	4	.	.	.	.	51	16	14	21	26	.	59	34	19	6	.	15	14
16	13	3	.	.	3	12	54	49	5	1	.	1	.	.	.	37	54	33	
6	2	3	.	.	5	1	
10	9	1	.	.	2	7	44	43	1	.	.	.	.	.	.	.	.	.	.	2	.	2	.	.	.	.	.	.	.	.	.	.
22	17	3	1	.	5	14	76	69	7	.	1	.	60	13	45	2	.	.	.	83	.	776	.	51	.	78	86	4	6	.	14	10		
27	23	4	.	.	14	9	78	71	7	
25	23	2	.	.	6	11	33	31	2	
35	24	9	2	.	12	23	24	22	2	.	1	1	11	9	2	.	1	.	.	12	10	1	1	5	.	19	15	4	.	3	1	6		
13	6	5	2	.	4	4	20	19	1	.	.	.	.	7	1	6	.	.	1	7	.	2	5	2	.	7	3	2	2	.	2	.
38	28	9	1	.	21	17	2	2	
34	21	13	.	1	6	28	52	45	5	2	.	1	2	
16	8	6	2	.	5	6	64	61	3	.	1	.	7	15	56	.	.	.	.	7	7	.	.	.	.	31	26	5	.	1	.	1
6	4	1	.	.	3	2	40	16	22	2	5	3	8	2	6	.	1	3	2	1	.	1	.	.	.	
26	21	5	.	.	7	17	28	19	7	2	6	4	2	.	1	.	1	
4	4	.	.	.	1	3	78	66	6	1	1	1	.	.	.	.	.	.	.	76	8	59	9	27	1	66	43	12	1	.	3	2
16	14	1	1	.	5	10	57	26	12	19	.	11	3	44	42	2	.	27	8	.	11	7	.	4	.	1	1	.	.	.	.	1
27	14	10	2	.	8	12	4	3	1	.	.	.	.	61	19	20	21	1	430	.	46	35	8	3	7	23	32	30	2	.	20	1
1	.	1	.	.	1	.	.	.	.	.	.	.	.	7	6	1	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.
3	2	1	.	.	2	59	49	9	1	.	2	2	.	.	.	.	.	.	.	69	6	53	10	23	.	78	76	3	8	.	13	.
1	1	.	.	.	4	.	.	.	.	.	.	.	.	1	.	1	.	.	.	82	16	7	24	17	.	52	49	16	1	.	2	3
1	1	.	.	.	1	27	13	8	6	1	5	2	.	.	.	.	.	.	.	17	16	1	.	1	.	2	1	.	.	.	.	.
.	.	.	.	.	45	21	7	17	.	4	3	98	.	20	78	.	69	7	.	83	62	19	2	69	2	26	20	4	2	4	4	6
40	29	11	.	.	9	6	66	65	1	

XVIII. METHODS OF CONVEYING WATER TO HOUSE

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
By hand.....	87	83	56	56	89	87	83	84
Drawing or hauling by horses...	3	..	..	..	11	11	3	11
Having water on tap in house...	4	..	22	44	10	2	14	2
Having w.c. and bath in house..	5	..	6	21	10	1	..	2

XIX. POWER ON FARMS

(Figures given are in percentage of number of farmers)

	N.S.	P.E.I.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
Using horse power on farm.....	100	100	100	100	100	100	100	100
Using other than horse power on farm.....	18	..	..	..	..	2	23	6
Using horse, engine or windmill for house and barn work...	70	45	76	55	19	31	12	17
Having windmill.....	4	3	3	11	20	26	3	22

Wednesday Afternoon Session

The Commission resumed its deliberations at 2.30 o'clock, Mr. Sifton in the chair.

THE CHAIRMAN :

We are going to have an address that is not mentioned on our programme. Mr. John W. Bruce, a representative of the United Association of Plumbers and Steamfitters, will speak to us on the necessity for uniformity in the laws relating to sanitary plumbing. I have much pleasure in calling on Mr. Bruce.

Necessity of Uniform Laws for Sanitary Plumbing

BY

JOHN W. BRUCE

General Organizer, United Association of Plumbers and Steamfitters

MR. CHAIRMAN and gentlemen : I appreciate the opportunity to appear before this Commission for the purpose of presenting for your consideration a subject matter of great importance to the welfare of the nation.

One of the essential features in the application of sanitation to the general health of the community is efficient methods of sanitary plumbing, heating and ventilation. In aiming to protect and prolong the life of the people, our efforts should be such that legislation upon this important problem may be in the best interests of the people in general.

Sanitation and ventilation have gained world-wide prominence through the endeavours of the medical profession, scientists, sanitary engineers and public bodies, for a number of years, to introduce measures that could be accepted as standards of efficiency, and by the earnestness of such men, there has been evolved a sanitary system based on fundamental scientific principles that can be adopted practically in any portion of the world. For the absolute protection of public health, legislation should be so directed as to secure the highest degree of efficiency in our sanitary system. Like all legislation of a restrictive nature, we find a great deal of opposition from those who are ignorant of the real value of such legislation, but with a process of education in the adoption and enforcement of restrictive law, by which the future life of the nation is protected and benefited, it is then readily welcomed as being essential to the national welfare. And it is with this view that I introduce this subject for the consideration of the Commission.

GENERAL CONDITIONS IN CANADA

In the Dominion of Canada we have no generally recognized standards regarding sanitary plumbing and ventilation, but are governed by a multiplicity of laws and by-laws, adopted by the governing bodies of our cities and towns and enforced according to their own interpretations. In the year 1887, Toronto adopted the first plumbing ordinance in Canada. This was followed by many others, until to-day the majority of our cities and towns have some form of ordinance. In some, we find a recognition of splendid principles making for effectiveness, but rendered void because of non-enforcement. In many others no recognition whatever that any law exists, with the result that even sanitary plumbing is installed in such a way that it becomes a menace to public health.

Alberta, New Brunswick, and Saskatchewan are the only provinces who have faced this problem seriously and have been progressive enough to adopt general laws. These laws, however, suffer to-day from lack of enforcement, though I believe that in the future their value will be more fully recognized.

In the majority of our larger cities, there is a desire to study and meet the demands of the plumbing business, so much so that we continually see them amending their by-laws to meet changed conditions. Many have adopted the plan of examining and licensing the men engaged in this occupation, with such beneficial results that many others contemplate following the same procedure, which is claimed as an essential point in placing sanitary plumbing on a proper recognized basis in its relation to health. From the Atlantic to the Pacific we have many varieties of sanitary plumbing, some a distinct credit to the forethought of our Boards of Health and Municipal Councils, and others an absolute disgrace to the name of sanitation. Some of the abuses call for serious consideration. Not long ago in a public school building, I saw sanitary drinking fountains with their waste pipes connected directly, without traps, to a two-inch soil waste. Many kitchens are contiguous to sanitary conveniences. Toilet accommodation is often placed in unventilated rooms contiguous to bedrooms. These abuses are of such a serious nature that they urgently demand attention.

In the city of Montreal, the first city of the Dominion, with a population estimated at 500,000, the general conditions of sanitary plumbing are a disgrace to civilization. While some buildings of the better type conform to higher standards, it is due more to the demands of architects than the requirements of the law. One can readily understand the high mortality rate of twenty per thousand,

when one sees the city's supposed system of sanitation. We see the ridiculous situation here, of examining men, who are to engage in the business, and then allowing them practical freedom in the installation of work, and many are installing work who have not even passed an examination. There is a measure of inspection of the plumbing, but without any test as to its fitness for the demands on it, by men, some of whom are not practical and have not the necessary knowledge to qualify them for such position of trust.

Then we have the city of Toronto, with an estimated population of 400,000 and a death rate of 12.8 per thousand. That city has a rigid by-law embracing the highest principles of sanitation, although recognizing some very low standards of materials that have been rendered obsolete for years, and a complete system of inspection, aiming to fulfil the requirements of the law so that the general health of the community is protected. Winnipeg, Calgary, Edmonton, Vancouver, Victoria and Halifax, each have their own ordinances recognizing certain principles, but often incorporating particular ideas and fads of individuals, who for the time being have had their fads added to the by-laws. But the bad conditions prevailing in some of our large industrial centres is a very serious matter. The city of Hamilton, with a population of over 80,000 people, without any recognized system, may be cited as an example, and also towns like London, Guelph, Kingston, Galt and Windsor, in Ontario, Quebec and Three Rivers in Quebec, Brandon and Portage la Prairie in Manitoba, Fernie and Kamloops in British Columbia, Amherst and Truro in Nova Scotia. The poor standard of work permitted, with practically no ordinances governing the work, all tend to lower the standards of efficiency in relation to sanitation. These large centres embrace a large working class population, which suffers most from the unsatisfactory conditions.

Smaller cities and towns will probably become large centres, and means to improve sanitary conditions by a universal standard should be the aim of all. Even now, with the advance of sanitary education, we see many of our cities working on amendments to their laws. Too frequently they lack knowledge of the science of sanitation, and do not recognize any set principles, being merely governed by what has been satisfactory in some other place. So that if by some action of a Federal body or central authority, a set standard were established, it would prevent the useless experimenting and continual alteration of laws, and would serve the real purpose for which such laws are intended. There can be no serious objection to legislation along these lines, as already all the important cities and towns, with few exceptions, have some form of local legislation and

any attempt at unification should receive support. In Western Canada an organization of plumbing inspectors, master plumbers, and journeymen plumbers was formed last year, whose object was the establishing, by mutual consent, if possible, of a uniform system in Western Canada, to overcome the present chaos, due to the multiplicity of laws in operation at present. Sanitary plumbing has made greater headway in Western Canada than in the East. Realizing its importance, they are trying to meet the demands of the future by a universal system of installation, inspection and examining and licensing of plumbers, and it cannot be denied that, at the present time, in those towns which have these standards, they are obtaining as high a degree of efficient sanitary installation as anywhere in the world.

ACCOMMODATION IN HOTELS AND PUBLIC BUILDINGS

One serious phase of sanitary law at present is the neglect of administrators to fix a standard of requirements for the necessary accommodation to meet the demands in the various buildings within their jurisdiction. In many of our cities the conditions of our hotels are deplorable. The sanitary conveniences, having to serve as public utilities, are over-taxed, and in many instances a lack of cleanliness is apparent. In such cases one cannot but experience a feeling of repulsion when forced to use them. And with the abuses in these conveniences comes the consequent danger of carrying disease away from them. Many of our hotels at the present time lack the requisite number of conveniences, on their public floors, demanded by competent authorities, and it is a common thing to find many of them without conveniences, or with disgraceful makeshifts on some of their residential floors. It should be the aim of governing bodies to so legislate that there should be a maximum of necessary sanitary conveniences based on the average number of guests occupying each hotel, and that proper attention be given to the requirements of the portion serving the purposes of public conveniences, with due regard to their construction, so as to serve the best interests of public health.

Many of our large public and office buildings, including departmental stores, are lacking at the present time to such an extent in sanitary conveniences, that they become nuisances. One can enter many of them and find them taxed beyond their usefulness by large numbers who use these places as public comfort stations, to the detriment of those employed in them. In such cases, efforts should be made to reserve a place for those who by their duties are compelled to remain within the buildings.

Our factories produce the worst forms of abuses and the word

"sanitary" applied to some of them is a misnomer. Some of their so-called sanitary conveniences become so repulsive through lack of attention to requirements and cleanliness, that they are a menace to public health. It is a standing disgrace, that in some factories the sanitary equipment does service for both sexes. Sometimes the water-closets are used as urinals, which is liable to cause filthiness, and by such use they become a danger instead of a benefit. In all places where men are employed in numbers, urinals should be compulsory, both from the standpoint of health and for the conservation of water, because less is required for flushing. Due regard should also be paid to light and ventilation.

The conditions in apartment and rooming houses are exceedingly unsatisfactory ; the efforts to conserve and economize space have not only been applied in the living-rooms but also in the bath-rooms. Too many fixtures are crowded into the space made available for them. Legislation should specify the minimum cubical contents of bath-rooms as well as of living-rooms. In rooming houses particularly, there is a lack of attention to the requirements of those who have to live in such places, especially in some cases where office buildings have been turned into rooming-houses. It is not an uncommon thing to find one water-closet, without bath or lavatory accommodation, serving the needs of the occupants of whole flats. Then again we have to meet the attendant evils due to the economic circumstances of those who use their rooms, not only as sleeping, but as living-rooms, in which they cook their meals, making it necessary for them to use the water-closet and lavatory basins as slop receptacles. It should be a firmly established law that no houses of this kind should be erected, without at least the minimum number of necessary sanitary conveniences being installed.

ACCOMMODATION IN PRIVATE HOUSES

With the present overcrowding of many of our private houses, we face serious conditions by the overtaking and misuse of sanitary conveniences. Dr. Hastings reported lately, that in Toronto alone, there were 3,000 houses originally intended for one family, that at present were harbouring from two to five families. On the other hand, we find large houses, with all the luxuries that wealth can command, fitted out with the finest equipment and installed under the best possible conditions regarding workmanship, and we recognize that these houses have the large measure of health protection they are seeking. In such cases, both architects and owners demand plenty of light and space for their bath-rooms and toilet accommodations. Contrast this with the crowded, ill-lighted, unventilated

conveniences of the smaller private houses and tenement flats with two to five families living under one roof ; then try to realize, that if it gives the protection desired in one, there is all the greater reason why legislation should be provided in the other to protect the great mass of struggling humanity.

EVILS OF SPECULATIVE BUILDING

One of the most disturbing factors to be faced is the speculative builder whose whole aim is the amount of profit he can make, and not the degree of efficiency he can provide, because he is not building for his own personal occupation, but for sale. With the competitive system prevailing, everything is kept down to such a minimum of cost, that all standards of efficiency are neglected, and supposedly attractive outside architecture is given more consideration than the conservation of the health of the future occupants. Even in those cities that have effective sanitary legislation they find at all times a desire on the part of speculative builders to encroach upon requirements of the law, and in many ways they are successful in doing so. When they cannot evade the law by using inferior materials, they will generally hire incompetent mechanics who sub-let work at such prices that competent men know that some means are being taken to avoid the law. The present time, when thousands of homes are being built annually, which will be the permanent residences of the future citizens of this country, is the opportune time for legislation. Immigrants have as much desire as our own people to have brighter and healthier homes where they can have the use of all the best devices for the safeguarding of health and the recognition of proper sanitary standards ; and they should be aided in that desire by such legislation as will guarantee them protection from the unjust exploitation being carried on by speculative builders.

PUBLIC COMFORT STATIONS

A great and growing need at the present time is the recognition by governing bodies of the necessity for public comfort stations. But one feels a sense of shame in having to admit that in the Dominion of Canada they are conspicuous by their absence. While some of our larger cities have met the public demand by the building of some in the public parks and popular resorts, still there is a decided absence of them where they are most needed, that is, in the busy sections of our cities. This is the reason that the demand is so great on the conveniences in our public buildings and hotels. The cities are practically making some of their property-holders assume the burdens they themselves should bear. This is an important problem and one that deserves more attention than ever it has

had in the past, and legislation should be enacted compelling the establishing of these stations in the busy centres, so as to satisfy a long-felt want.

NEED FOR SANITARY DRINKING FOUNTAINS

Providing sanitary drinking fountains in public places, as urged by the medical profession as a preventive of disease, is another means whereby the health of the nation can be conserved. While there has been a great deal of progress, still due regard has not been shown in the erection and installation of these necessities. Many times they are erected in inaccessible places and allowed to get into such a filthy condition that they become repugnant and dangerous. They should be erected in the most accessible places, where there is plenty of light and fresh air so as to keep them free from contamination, and they should be so installed that they will not become part of the ordinary sanitary system of any building without proper interception from the main drains.

NEED FOR UNIFICATION IN LEGISLATION

With the advances that are taking place in sanitary, heating and ventilating equipment, the necessity for forming a codification of the laws dealing therewith is increasingly felt. While there may be some impediments in the way, owing to the multiplicity of legislative enactments, still with co-operation these may be overcome.

Such states as Illinois, Ohio, Wisconsin and Massachusetts have adopted very successful state laws, granting enlarged powers to the Boards of Health and setting standards that have been found to operate successfully all over their respective states. State inspectors of plumbing are appointed, who are charged with examining and licensing the men who desire to engage in that occupation. Knowing the many constitutional difficulties that beset them, we feel encouraged to take similar steps to protect the lives of our people. Under our present system with our multiplicity of laws and the elasticity of many of them, the defects are manifold. The many interpretations put on our laws, due to lack of rigid forms of administration, is surprising. In many towns we find the administration left in the hands of an unsympathetic department, or men being employed as inspectors who have no knowledge of the occupation, and who have been selected purely for personal or political reasons. Hence, we may expect to find that low standards of workmanship, which are a menace to public health, are very common.

To realize what this means, we have only to compare the morbidity and mortality statistics of the highly protected towns with

those whose administration is lax. Most forms of disease are quite susceptible of abatement by a properly regulated, hygienic system of sanitation. Dust, filth, foul air, lack of light and ventilation, are very important factors in the spread of tuberculosis and acute contagious diseases. Taking five cities under similar conditions we find the following results in 1913 :

Deaths per 100,000	Tuberculosis	Typhoid
Toronto.....	95.7	10.4—5.3
Milwaukee.....	87.1*	11.5
Cleveland.....	129.3	14.1
Buffalo.....	126.6*	15.2
Montreal.....	208.06	20.55

These figures show a great difference between the highest and lowest city and they can be practically arranged in the same order as to the effectiveness of their sanitary legislation.

These convincing figures and facts prompt the efforts of medical men, sanitary engineers and practical plumbers to seek rigid laws governing the installation of such work.

At the present time Halifax, Montreal, Port Arthur, Moose Jaw, Saskatoon, Edmonton, and Calgary have examinations for plumbers, but no two cities or towns in the Dominion have similar laws. The mechanic, who for economic or other reasons, travels in search of employment, has to undergo the ordeal of qualifying in each of those towns on a different basis. By the adoption of a universal plan, the mechanics engaged in the plumbing industry, once qualifying, would be fitted to meet the conditions in all parts of the Dominion.

The business should be governed by stringent regulations, irrespective of obsolete and fallacious ideas, as the work demanded of plumbers will compare favourably with any other required in building, both for usefulness, and in the degree of intelligence and ability required.

PROPOSED FEDERAL LAW

Realizing that the cities and towns of the Dominion recognize the value and necessity of by-laws for the control of sanitation, ventilation, etc., and are making an endeavour to meet the situation by local regulations, it becomes imperative that the Federal Government should pass legislation that will serve as a minimum standard, leaving the cities free to supplement the Dominion law, by any special regulations that may seem to be necessary by reason of climatic conditions.

*Pulmonary tuberculosis only.

The advance of sanitary engineering has opened up an avenue whereby farmers and those living in rural districts can have all modern sanitary comforts, but the only measure of protection that can be afforded them, since they are all outside the reach of a city's by-laws, is a federal law, which would apply to the whole country.

GENERAL HEALTH REVIEW

The importance of the protection of human life should be the first consideration of every nation and any measure directed to that end should receive serious and earnest consideration. Every country to-day has to meet this new demand made by the advancement of science. It is to be regretted that in some of our cities we have such a high mortality rate and this is due in a great measure to the lack of recognition of sanitary law. The following comparison of the death-rate per 1,000 in 1913 in five important cities is instructive :

Toronto.....	12.9
Milwaukee.....	13.23
Cleveland	14.14
Buffalo.....	15.76
Montreal.....	21.51

Due regard should be shown to cleanliness, with rigid forms of periodical inspections by competent inspectors. Cost is a matter of minor importance as compared to the protection received from efficient plumbing. Again, lack of attention to ventilation has been a source of trouble and due regard should be paid to the securing of pure air, in all buildings. Stringent regulations should be drawn governing the use of the many mechanical appliances at present used for ventilation.

CONCLUSION

Every country in the world at present has had to face these problems in one form or another and the statutes of every state and nation are replete with laws concerning public health. Forty years ago plumbing was considered a luxury, but at the present time, sanitary plumbing is a necessity and within the reach of everybody, even dwellers in rural districts, and is now recognized as essential to public health.

The protection afforded by legislation has been the result of education, and some conditions once tolerated are now known as dangerous to life and are therefore controlled. But the matter has been so long left to the will of the individual cities and towns that any attempt to over-ride these privileges has been resented. With

the advance of science and a broader spirit recognizing the demands for a greater measure of protection of human life, some countries are now facing these problems by the introduction of state laws.

At the present time, with the power reposed in this Conservation Commission, of recommending legislation for the advancement of the interests of the people of this Dominion, we are in a position to make as much progress in sanitation as any country in the world, showing that the conservation of human life in this Dominion is considered to be of supreme importance, and that the powers of governing are being used in the interest of the national welfare, with the aim of producing a healthy, happy race of people.

THE CHAIRMAN :

We shall now have a report of the English Speaking Conference on Infant Mortality, by Dr. Hodgetts.

English Speaking Conference on Infant Mortality

A REPORT BY

CHAS. A. HODGETTS, M.D., D.P.H., ETC.

Medical Adviser to the Commission of Conservation

IF we expect anything great in the future of our Dominion we must care for the child. We may conserve our forests, we may educate in all that concerns agriculture, we may breed foxes and other fur-bearing animals and we may tie up our rivers so as to produce, for all time, the power and heat which will be required when our coal is exhausted, but of more importance than any of these is the character, physical, moral and mental, of the future citizens of the country.

The child is truly the father of the man, and, even in the pre-natal period his whole future may be influenced either for good or for ill. In considering the problem of the child, therefore, it is essential that fatherhood and motherhood be taken into account. In some respects problems of public health concern the urban portion of our population more than the rural, but the care of the child is of as much interest to rural parents as it is to those of the town and city.

It is lamentable that parents generally know more with respect to the care and feeding of domestic animals than they do of human infants. The ignorance that prevails concerning the care of babies, in these enlightened days is criminal, and it is safe to say there is no subject coming within the scope of this Commission of greater mo-

ment and yet surrounded with more difficulties than the care of the child.

From my experience as a medical man, I am free to say that even medical men often do not know how to care for their own children. I could give you many instances of where bright and intelligent medical men have had their children suffering from diseases simply because of the want of knowledge and the exercise of forethought on the part of the parents.

As an indication of the Imperial character of the Conference on Infant Mortality held in London in August, 1913, it may be said that twenty-five representatives of the Overseas Dominions were present and took part in the discussions. The Commission of Conservation was officially represented by the Medical Adviser. The various subjects discussed and the resolutions adopted by the Conference, are of importance to every parent in Canada, and it is felt that a wide dissemination of the information gained cannot but result in furthering the conservation of child life and the better protection of infants throughout the English-speaking world.

The Conference was called by the British Government and was presided over by the Rt. Hon. John Burns, who, in the course of his inaugural address, dwelt on the need of adjusting the health conditions of the people to the conditions that were developing as the result of expansion of trade and the growth of urban centres. He referred to the influence of working mothers on infant mortality, illustrating it by a comparison of two similar communities, Burnley and Battersea, where the infant mortality was respectively 171 and 83 per 1,000. The difference was attributed to the fact that in Burnley a large percentage of the mothers were at work in factories or other places of business, while in Battersea a much larger percentage remained at home. Mr. Burns declared that for four months before the baby was born, and for longer afterwards, mothers should be *mothers* and not drudges. He deplored the number of childless women of the better classes who were wasting their motherly instincts on pet dogs. Such women could perform valuable services by adopting homeless children.

After the opening ceremony, the Conference carried on its work in two sections, each of which held four sessions. The Chairmen of the sessions were :

Her Excellency, the Countess of Aberdeen

Sir George Newman, M.D.

The Rt. Hon. Joseph Pease, M.P.

Dr. Arthur Newsholme, C.B.

Dr. Charles A. Hodgetts

At the closing meeting on August 5th, resolutions were passed urging that :

1. Maternity benefit be made the property of the mother.
2. Adequate attention be paid to good bodily health and development and fitness for maternity in young girls, as well as to education.
3. Still-births be registered.
4. Greater completeness be required in medical certificates of death.
5. Better places be given for infant hygiene in the medical curricula of Colleges.
6. An International conference be held to enquire into the causes, treatment and prevention of venereal diseases.
7. The Parliament of Great Britain be urged to pass "The Milk Bill" with as little delay as possible.

Every facility was afforded those who attended the Conference to visit the various institutions in London and the vicinity, such as, the hospitals for infants, women and children, the lying-in hospitals, poor law institutions, schools for mothers and infant consultations, day nurseries, homes for orphans, training homes and vacation schools.

It may not be out of place to give the following brief *résumé* of the more interesting topics discussed.

ADMINISTRATIVE SECTION

RESPONSIBILITY OF THE CENTRAL AUTHORITIES

Dr. F. E. Fremantle, county Medical Officer of Health for Hertfordshire, pointed out that the annual infant mortality in England had been reduced from 150 to 95 per 1,000 during the last fifteen years owing to wise legislation. As a consequence, every year 50,000 infants are saved. He declared that it is now time for the State to concentrate the efforts of the various agencies concerned in public health administration, while at the same time not losing sight of the value of local initiative and responsibility. This would mean the establishment of a department of Health, and would provide for the administration of the Factories and Workshops Act, Part I of the Insurance Act, the Medical Acts and the Midwives Act, as well as the various branches pertaining to health which are now administered by the Local Government Board. To such a Department too, would be relegated the oversight and care of infants.

In speaking of the same subject, the Medical Adviser of this Commission claimed that it was the function of the State and the Municipal Health Departments to adopt and carry out measures essential to the conservation of child life, such as :

1. The inspection of the home.
2. The education of the people in all that pertains to the life of the baby, the child, and the mother.
3. The betterment of the environment for the child both within as well as without the home.
4. The oversight of institutions having for their object the care of infants. Local health authorities especially, should endeavour to better conditions within the homes so as to check the present terrible waste of infant life.

Dr. R. Caton spoke of the good work accomplished by the Health Committee of the city of Liverpool in its effort to care for and protect the lives of infants from birth till they had reached school age. He emphasized the necessity of breast feeding and the avoidance, if possible, of all other food during the first few months of the child's life. He showed clearly the need for greater care in the providing of proper food for nursing mothers of the poorer classes. He declared that the education of school girls in the higher grades should include instruction in the simple rules of hygiene and house management, as well as the general rules of nursery management and the dieting of infants. It was also highly essential that municipalities should insist that dwellings be maintained in a sanitary condition, and ought, if necessary, to provide for the erection of healthy homes for families.

As a part of municipal responsibility, Dr. H. J. Gerstenberger, Cleveland, Ohio, described the work for infants that is being carried on in that city. An infants' clinic and an association of visiting nurses co-operate to supply milk for infants and, at the same time, educate the mothers in the home. This clinic is also used for instructing medical students in the diseases of infants. The whole work is co-ordinated with that of the city Board of Health, thereby securing municipal assistance as well as making provision for charity work.

Miss Julia C. Lathrop of the Federal Children's Bureau of the United States outlined the work that the Bureau is endeavouring to do. It is a Branch of the Federal Government devoted to the interests of the children of the nation, and vested with powers which permitted of methods of investigation and publicity analagous to those by which the Department of Agriculture has increased the

productiveness of the soil and added to the wealth of the farmer. The statute provides that the Bureau shall investigate and report upon "all matters pertaining to the welfare of children and child life" among all classes of American citizens. It shall especially investigate questions of infant mortality, birth rate, orphanage, juvenile courts, desertion, dangerous occupations, accidents, diseases of children, employment, and legislation affecting children in the several States and Territories. * * * * * The chief of the Bureau may, from time to time, publish the results of these investigations, and for the discharge of these duties the statute provides a staff of 15 persons and an annual appropriation of about \$30,000.

It is to be noted, however, that such enquiries are not, unfortunately, medical enquiries. They are simply enquiries into social, industrial and economic conditions surrounding child life. As they, therefore, omit some of the most important essentials in arriving at intelligent conclusions as to the causes affecting infant mortality, they seem to be lacking in efficiency in that particular respect.

Mrs. Kitson Clark, President of the Leeds Babies' Welcomes Association, stated that there were 200 voluntary societies in Great Britain which have undertaken very wide functions in matters of child hygiene. These functions include lectures to mothers on hygiene, home-nursing, care of infants, infant consultations, milk depots and home visiting. Of these societies 17 are entirely municipal, 31 partly municipal and partly voluntary, 131 entirely voluntary, and 12 are voluntary babies clubs in Ireland. Many of these voluntary societies do their own work without paid officials; others pay for the work of experts, and in some the voluntary workers are under the direction of the Public Health authorities.

Mr. James Gray, Secretary of the State Children's Council of South Australia, after giving statistics relative to infant mortality in that State, said that it had been found in South Australia that the best means of lowering the mortality rates was the placing of the children in homes, as far as possible one in each home. Institutional life for babies, especially when not in good health, was derogatory, but supervision by qualified inspectors under an authority vested with ample powers to enforce the best attainable treatment of the children by mothers and relatives was essential. Breast feeding, where possible, was provided for; if not, feeding according to wise regulations and supervision was continued until children were seven years of age.

In discussing the question of Medical Inspection of infants and children under school age, Dr. David Forsyth, Charing Cross

hospital, outlined the plan adopted by the city of Westminster, which in 1912 opened a Medical Inspection Centre for children under school age. This Centre is conducted in co-operation with the health authorities, and as soon as a birth is recorded, one of a staff of health visitors of the Centre gets in touch with the family. The mother is subsequently invited to the Centre with her baby, where it is weighed and examined and the mother is advised as to her method of clothing and nursing the child, etc. When the child is physically defective, medical care is provided either at the hospital or dispensary. A varying number of children are thus cared for up to the sixth year of life.

Dr. H. L. K. Shaw, Albany, New York, discussed the problem of the 'institutional infant.' He was of the opinion that there was no nearer solution than years ago. He was also of the opinion that the foundling and the motherless baby should be provided with a suitable home with wet nursing, and that, whenever possible, the mother and her infant should not be separated. He also advocated the establishment of infants' hospitals in every community to provide for the babies requiring medical and surgical care.

THE ADMINISTRATIVE CONTROL OF CITY MILK SUPPLIES

Dr. J. M. Beattie, Liverpool, referred especially to bovine tuberculosis as one of the causes of death, as well as of the disablement of a considerable number of children. He considered it "the merest folly to try in any way to compel the sterilization of all milk which is sold, even if this were desirable, and so long as unsterilized milk can be bought we can have no guarantee that children will not be fed upon it." He further was of the opinion that "we may preach sterilization from morning till night and from year's end to year's end and the majority will remain obdurate to our preaching." He advocated the "energetic control of our milk supplies by the compulsory inspection of cows, cow-sheds, dairies, etc., by competent inspectors under the control of skilled administrative officers, assisted by scientific observers who are skilled bacteriologists." In concluding his remarks he summed up as follows :

1. The systematic inspection of cattle should be placed in the hands of full time veterinary inspectors.
2. An isolation farm should be established by the local authorities where suspected animals should be kept for observation and diagnosis.

3. The farmer or dairyman should be paid for the milk supply which he necessarily loses during the four or more weeks of isolation, if the cow is proved to be non-tuberculous.

4. The testing of the milk and other secretions should be entrusted to experienced bacteriologists.

Asst. Surg. Gen. Kerr, United States Public Health Service, spoke of the supervision of the milk supplies of the United States and its bearing on the public health. He claimed that the methods and standards under which certified milk was produced and distributed in that country represent the ideals of dairy hygiene, the adoption of which the United States Public Health Service has encouraged by publication and distribution of the methods and standards as prescribed from time to time. He was of the opinion that dairy inspection, as practised in the United States, tends to provide a cleaner market milk supply, but that it is inadequate to ensure constant freedom from the infections of tuberculosis, typhoid fever, diphtheria, scarlet fever and septic sore throat, and to a lesser degree the causes of infantile diarrhoea. He favoured as a temporary measure, pasteurizing the milk supplies under official supervision.

Dr. W. G. Savage, County Medical Officer of Health, Somerset, pointed out that the milk supply requires special control; that milk is a fluid which is an admirable media for the development of bacteria so that any contamination it receives is multiplied manifold. He claimed that:

1. The administrative control must be removed from the hands of the rural sanitary authorities.

2. The urban population should contribute towards the expense of administration, as the benefits are mainly to the large towns.

3. The dairyman must be educated up to the special obligations of milk production as regards care and cleanliness, and liability to transmit infectious diseases.

4. The consumer must be educated to consider the value and importance of clean, pure milk.

5. The cost of production must be lowered by co-operation and that co-operation must be utilized in order to transmit the milk in the proper condition.

Dr. E. W. Hope, Medical Officer of Health, Liverpool, stated that as a result of careful researches by Prof. Beattie of the University of Liverpool, milk can be effectually sterilized by electrolysis and all extraneous organisms destroyed, while at the same time no change whatever takes place in the milk; the flavour, taste, chemical composition, etc., being the same as in pure, fresh milk. The process, he stated, is very much cheaper than ordinary pasteurization. As an evidence that this method has passed the experimental stage, it was stated that the corporation of Liverpool had authorized the installation of a plant at one of their depots for the supply of sterilized milk.

Dr. J. W. Brittlebank, Manchester, discussed veterinary aspects of the control of the milk supply. He said in part :

"We know full well that practically one-third of the dairy stock of this country (Great Britain) are tuberculous in some degree. Fortunately, only a small proportion of these are dangerous to either their fellows or human beings ; but the magnitude of the work which requires the elimination from our herds of approximately one million cows must be recognized, and it behooves the authorities to proceed with caution. It has nevertheless been demonstrated that definite tuberculosis can be eliminated from herds and that such herds can be kept free from tuberculosis, and it has further been shown that this can be carried out on a commercial basis and not merely as a scientific fad."

MEDICAL SECTION

THE NECESSITY FOR SPECIAL EDUCATION IN INFANT HYGIENE

Dr. L. E. La Fétra, New York, spoke of the necessity for special education in infant hygiene, with particular reference to the medical profession. He said, that it is manifest that special education for the medical profession in infant hygiene is needed, and stated that he considered every student should have impressed upon his mind the influence upon infant life and infant health of the following : (*a*) heredity, (*b*) pre-natal care, (*c*) childbirth, (*d*) special care of premature and feeble infants, (*e*) infant feeding, (*f*) weaning, (*g*) artificial feeding, (*h*) normal development in infancy, (*i*) hygiene of the baby, (*j*) hygiene of the nursery, (*k*) prevention of infection, (*l*) agencies for infant care and child help and their relation the one to the other.

The necessity for special form of education in infant hygiene for the public in general was dwelt upon by Dr. C. P. Lapage, Manchester. He was of the opinion that overcrowding in cities contributes largely to a high infant mortality, and held that the only

remedy for this overcrowding was in a wider distribution of large manufactories. Working people must live near their work, and, if all the large factories and mills are crowded together, without proper transportation facilities, bad housing is inevitable. The speaker emphasized the prevailing ignorance and helplessness of mothers, in cases of difficulty arising during the course of breast feeding, and asserted that far too many babies are weaned because of some slight difficulty. He claimed that too often, this weaning is done on the advice of medical men and midwives. In this connection he advised the employment of efficient visitors to the homes.

The method followed in New Zealand for promoting the health of women and children was described by Dr. F. T. King. He stated that there exists in that colony an organization known as the "Society for the Health of Women and Children" which has established branches in 70 centres throughout the islands. The aims and objects of the Society are :

1. To uphold the sacredness of the body and the duty of health ; to inculcate a lofty view of the responsibilities of maternity and the duty of every mother to fit herself for the perfect fulfilment of the natural calls of motherhood, both before and after childbirth, and especially to advocate and promote the breast-feeding of infants.

2. To acquire accurate information and knowledge on matters affecting the health of women and children, and to disseminate such knowledge through the agency of its members, nurses and others, by means of the natural handing-on from one recipient or beneficiary to another, and by the use of such agencies as periodical meetings at members' houses or elsewhere, demonstrations, lectures, correspondence, newspaper articles, pamphlets, books, etc.

3. To specially train and to employ qualified nurses, whose duty it will be to give sound reliable instruction, advice and assistance, gratis, to any member of the community desiring such services, on matters affecting the health and well-being of women, especially during pregnancy and while nursing infants, and on matters affecting the health and well-being of their children ; and also to endeavour to educate and help parents and others in a practical way in domestic hygiene in general.

4. To promote legislative reform in matters pertaining to the betterment of the health of women and children.

5. To co-operate with any present or future organizations which may be engaged in furthering the foregoing or cognate objects.

These things are done with a view to conserving the health and strength of the rising generation, and rendering both mother and offspring hardy, healthy, and resistive to disease.

Dr. King said that the Society is less concerned in reducing the death rate than in improving the health of the people. As a Society for the promotion of health it is more interested in firmly establishing the all-round fitness of the 25,000 infants born in New Zealand yearly than in reducing the potential deaths from 2,000 to 1,000.

Dr. Caroline Hedger, Chicago, spoke on "The Relation of the Education of the Girl to Infant Mortality." From the point of view of possible motherhood there seems to be three classes of girls in the schools : First, a small number who are so strong physically that no strain will hurt them. At the other end of the scale occurs a group, unfortunately larger, who by inheritance, lack of nervous balance and acquired infections, should never reproduce ; and between these two extremes stand the large mass of girls, some with only slight deficiency in one line, others admirably fitted to reproduce ; some with many deficiencies and only a few chances that their reproduction would be desirable for our race. She stated that on our treatment of them in the school depends, to some extent the future of this variable class, and claimed that with a rational treatment we might be able to eliminate all the undesirable factors except hereditary taint.

Her conclusion, in part, was that we have to study thoroughly breast-feeding in relation to the educational stresses, and child-bearing in relation to menstruation. We have to adjust consistently our school classes to the maternal possibilities of the girl. If she can develop with stair climbing, examinations, music, and multitudinous social distractions, all well and good. If she cannot come to full development under this kind of treatment we must know it and relieve the strain.

"The Necessity of Improving the Training of Midwives and its Bearing upon Infant Life" was discussed by Miss Alice Gregory, Hon. Secretary of the Council for the Higher Training of Midwives. After pointing out that the many and intricate matters to be learned by the midwife, she indicated what was being done in France, Holland, Belgium and Italy, where they demand that all midwives shall have had a two years' training; the time to be spent not only in lecture and labour rooms, but largely in the lying-in wards and nurseries

attached, thus affording the midwife an opportunity for gaining the knowledge so essential to the betterment of infant life.

Dr. Macleod Yearsley, London, pointed out the importance of the Prevention of Ear Diseases in Infancy and outlined the recommendations of the National Bureau for the Prevention of Acquired Deafness, which are :

- (a) The prevention of diseases which cause deafness :
 - 1. Notification of all forms of meningitis for isolation, treatment and research,
 - 2. Notification of all cases of congenital syphilis with a view to facilitating treatment of mother and child,
 - 3. Improvement in hygiene, housing and the feeding of children in the first years of life ;
- (b) The better management of ear disease when it occurs :
 - 1. The appointment of otologists on the staff of every fever hospital,
 - 2. All aural school clinics and treatment centres to be under a specialist or specialist supervision.

MEDICAL MILK PROBLEMS

In considering "The Economic Uses of Dried Milks and Patent Foods," Dr. Eric Pritchard, London, discussed the advantages of desiccated milk and stated that his conclusions were as follows :

- 1. Different varieties of dried milk have different properties and are suitable for different classes of cases.
- 2. Dried milks are free from pathogenic germs, and consequently safer than natural milk.
- 3. The cost of reconstituted dried milk is the same as dairy milk, but if separated dried milk is used and fortified with a cheap substitute fat (Marylebone cream) the food thus constituted is the cheapest that can be employed and the results are excellent.
- 4. Proprietary foods are expensive and do not accurately conform to the standard of breast-milk.
- 5. To obtain the best results with dried milks they must be modified to the required standard, which differs with different infants. This is easily accomplished by varying the dilution and adding varying proportions of fat and sugar.

The question was further discussed by Dr. A. E. Naish, who was of the opinion that in dried milk we have a food which contains the same substances as cow's milk and in the same proportions (except when humanized) ; which is digestible to a wider range of infants ;

which has obvious advantages of storage and distribution ; and which appears to have no tendency to promote any of the later nutritional disorders.

Dr. F. Langmead, London, described the benefits of "Artificial Feeding of Infants by Citrated Whole Milk." He clearly stated, however, that it is not a panacea for all the digestive disturbances to which infants are prone. As a result of feeding by this milk it was claimed that progress in weight and strength of infants justified the claims made for it. Rickets, gastric dilatation, and that puffy and pasty appearance so commonly seen in babies fed on diluted milk, do not develop ; on the contrary the muscles are particularly strong and firm.

Dr. G. R. Pisek, New York, presented a paper on the subject of "Milk in the Poor Home," and stated that the standards of pure milk as set forth by the National Commission on Milk Standards, appointed by the New York Milk Committee in March, 1911, were as follows :

Grade A.—Certified milk, or its equivalent

Grade B.—Inspected milk

Grade C.—Pasteurized milk

Grade D.—Milk not suitable for drinking purposes.

It recommended that milk suitable for infant use should not contain more than 100,000 bacteria per cubic centimetre when used raw, and if pasteurized, not more than 10,000 bacteria per cubic centimetre when ready for consumption. It condemned the use of "loose" or "dipped" milk except under carefully guarded conditions. These findings, with slight modifications, were subsequently adopted by the Board of Health of New York city. It was stated that the deaths under one year in New York city had dropped in two years from 125.6 to 105.3 per thousand, as a result of a campaign principally directed against the causes of summer diarrhœa.

Dr. F. B. Talbot, Harvard Medical School, discussed "The Wet Nurse Problem," and he was firmly of the opinion that infant mortality can be lowered from about 90 per cent to a minimum by insisting that wet nurses be not allowed to take a position, in any instance, without their babies. He was also of the opinion that the wet-nurse problem could be solved by establishing a Directory for Wet Nurses such as had been outlined in the body of his paper. He stated that such Directories had already been established in the cities of New York and Boston.

ANTE-NATAL HYGIENE

Dr. J. W. Ballantyne, London, was of the opinion that the question of the destruction of ante-natal health by syphilis was a subject on which, at the present time, there was most pressing need for frank speaking and full recognition. He pointed out further, that, if syphilis be the most potent of all the causes of ante-natal death and disease, there comes the most hopeful outlook for treatment both preventive and curative, as the cause, the *Spirochæta pallida* is amongst the most easily recognized of microbes, and there is a reliable blood test for the presence of the disease, known as the Wassermann reaction. For these reasons, the malady can be easily diagnosed both after death and during life. Dr. Ballantyne claimed that there is no other ante-natal disease more susceptible of treatment than that of syphilis.

The speaker indicated some of the ways in which ante-natal hygiene may be fostered, as follows :

1. It is essential that authoritative facts regarding the extent of ante-natal diseases and deaths be forthcoming. This means the introduction of the compulsory registration of stillbirths and, if means can be devised, of abortions as well.

2. Enquiries should be made into local conditions and especially into the sale of abortifacient drugs where the still-birth rate is found to be high, and some sort of check should be put upon the present facilities for the obtaining of medicines and nostrums for the procuring of miscarriages.

3. The medical profession should take a more active part in the supervision of pregnancies.

4. There should be supervision of the pregnancies of the poor as well as of the the middle and upper classes. All maternity hospitals should be furnished with pre-maternity or pregnancy wards, for the reception of patients who are suffering from one or other of the diseases of the pregnant state.

5. A more substantial maternity benefit might be given to those mothers who made the announcement, together with the establishment of large pregnancy departments in maternity hospitals where these women could rest and receive treatment before their confinement.

In a most forceful and excellent paper, Dr. F. W. Mott, Pathologist to the London County Asylums, discussed "Congenital Syphilis as a Cause of Infant Mortality," and indicated the preventive measures which could be undertaken by the authorities. In conclusion he said :

"The disease is preventible, then why not prevented? You may ask: What should be done? I would say, first and foremost, do not cover up the evil from a false prudery; let it be widely known. Educate the public conscience to the necessity of seriously dealing with the question from a preventive as well as curative point of view. A fruitful commencement could be made by examining the bloods by the Wassermann test of all suspect mothers and children. All those mothers with a positive reaction, even if *apparently* healthy, could be treated with a view to their bearing living children. All children born of suspect parents, even *apparently* healthy, but who gave a positive reaction, could be treated until the reaction was negative, with a view to the prevention of disease later in life. Government or municipal laboratories employed for this purpose would not only thereby perform an important service for public health, but prove of great economic value by diminishing greatly the infantile mortality, and the prevention of incurable diseases occurring at all ages. Finally, it is desirable, as suggested by Sir Malcolm Morris, that a Royal Commission be appointed to inquire into the best means to be adopted for the prevention of the spread of syphilis and other venereal diseases."

Dr. J. M. Munro Kerr, Glasgow, in speaking of "The Toxæmias of Pregnancy and their Effect upon the Maternal and Infantile Mortality," spoke at some length upon the medical aspects of the question and claimed that the Public Health Departments could and should lend material assistance in the work of the care of pregnant mothers. He claimed that every pregnant woman should be looked after during her pregnancy and the complications of pregnancy treated at an early stage. Proper arrangements should be made for the woman's confinement and thus many of the more serious complications of parturition might be prevented. Arrangements for the care of the new-born should be made as regards food and clothing, and thus many infantile deaths prevented, and many more children could be started in life healthy and well nourished.

Altogether the Conference was a marked success and I trust that through the distribution of the report a keen interest will be aroused in the subject of infant welfare in Canada. The National Council of Women is alive to the importance of this great work, and with its support much may be looked for.

THE CHAIRMAN (Senator Edwards): We shall now have an address by Hon. A. E. Arsenault on the Leasing of Oyster Beds in Prince Edward Island. Premier Mathieson was to have discussed this subject, but I learned, only this morning, that it would be impossible for him to be present and Mr. Arsenault has kindly consented to address us in his stead.

Leasing of Oyster Beds in Prince Edward Island

BY

HON. A. E. ARSENAULT

Member of the Executive Council of Prince Edward Island

MR. CHAIRMAN : You will, I am sure, appreciate the fact that I have had but a few hours' notice that I would be expected to address you. However, I shall endeavour to outline something of the progress that has been made in Oyster Culture in Prince Edward Island since the province secured the right to lease the "bottoms."

It has been estimated that there are one hundred and fifty thousand acres of "bottoms" in Prince Edward Island suitable for oyster culture. In many portions of St. Peter bay, which has an area of three thousand acres, the production of oysters in times past must have been enormous. It is a fact that, in portions of this area, twenty-five to thirty feet of oyster shells and mud may be found. These mud-beds or flats are now valuable as an almost inexhaustible supply of fertilizer, but absolutely valueless for the cultivation of oysters.

The so-called Malpeque oyster has its home in Richmond bay on the north side of Prince Edward Island and derives its name from Malpeque, a village on the shore of the bay. The fishing of this oyster has been carried on from the first settlement of this part of the country, over a century ago, and as indicating the result of over-fishing and the destruction wrought by star-fish, I may say that the production of oysters on Prince Edward Island has declined from 57,000 barrels in 1882, to less than 8,000 barrels in 1912. At the same time the price has gradually advanced from \$1.00 to \$1.50 a barrel in 1880, to \$10.00 or \$12.00 a barrel in 1913. If over-fishing and star-fish depredations had continued, it would have been a question of only a few years until the Malpeque would have disappeared.

The experience of other countries, notably France, England and the United States, clearly indicates that private cultivation is the only means for conserving the Malpeque. Until less than two years ago, however, jurisdiction over the fisheries of Canada, was divided ; each province, sharing with the Federal authorities the control of its own fisheries. Some attempt at a remedy was made a few years ago when a tentative agreement was forwarded by the Dominion Government to the several provinces for approval. This provided for a transfer of the rights of the provinces to the Dominion

and, in the case of oysters, the Federal authorities proposed leasing the areas and dividing the net proceeds equally with the province concerned. Prince Edward Island refused to accept this suggestion, and about two years ago, negotiations were instituted by the Prince Edward Island Government, which resulted in the present satisfactory arrangement by which the provinces were given almost absolute control of their own oyster areas. In the summer of 1912, an engineering staff under our chief engineer, Mr. Shaw, made a complete survey of Richmond bay, and other oyster areas, with a view to leasing them for private cultivation. At the close of the year 1913, over five thousand acres had been leased and applications for an additional two thousand acres of ground had been received. A few of the difficulties that have been encountered in the development of private culture are :

1. Opposition of the local fishermen, resulting from prejudice and ignorance of the benefit to be derived from private cultivation, not only to the lessee but to the fisherman himself.
2. Night-poaching on private beds.
3. Destruction of oysters by star-fish.

As to the prejudice of the local fishermen, it will no doubt gradually disappear, when the benefits accruing to the industry, through the re-stocking of public beds, have been demonstrated. The fishermen themselves will benefit as a result of the increased demand for labour. At the same time, the province in general will be advantaged through the cultivation and exportation of oysters in large quantities. It is proposed to prevent night poaching by the erection of a strong search-light on an island in Richmond bay. In addition, one or more high power motor boats, which can follow and overtake the poachers, will be provided. The destruction of oysters by the star-fish, especially on public beds, is a more serious problem. Lease holders are spending large sums for the protection of their beds, but their efforts will be to a large extent neutralized by the continued invasion of their beds by star-fish from the public beds. Negotiations are now in progress with the Dominion Department of Marine and Fisheries with a view to getting the Department's assistance in protecting public beds from their depredations. In spite of these difficulties, however, the industry offers a splendid field for investment.

MR. BEER : Would the price of a barrel that you mentioned, be "on the shore" or "on the market?"

MR. ARSENAULT : As high as \$10.00 has been paid for the genuine Malpeque on the shore ; they would sell as high as \$13.00 in Quebec.

MR. BEER : Where is the market at the present time ; in Canada ?

MR. ARSENAULT : Chiefly in Canada.

MR. BEER : I would like to know concerning the transplantation of American oysters into Island waters, in order that they may be marketed as Malpeques.

MR. ARSENAULT : This has not been carried on very successfully as yet, chiefly because the oysters that have been transplanted have been two and three years-old oysters which have been left for too short a time in our waters. I believe, and it is the general belief of those who have had experience, that the second-year, American oysters, imported and placed in our beds and left for two seasons, will acquire the identical taste and flavour of the true Malpeque. This has been proved by experiments with small quantities that have been imported. One season in our waters is too short a time.

DR. J. W. ROBERTSON : Were not the American oysters that were placed on the farm at Summerside even younger than two years, and were they not a good success ?

MR. ARSENAULT : With the exception of a very few, none has yet been on our beds for two years. However, I was informed by a Quebec dealer who bought some fifty or sixty barrels of American oysters that had remained only one season on the Prince Edward Island beds, that he had had an unqualified success with them. They were greatly in demand and he could have disposed of a great many more if he had had them.

MR. BEER : Has any report ever been prepared giving the different varieties of oysters found in Prince Edward Island waters ? I remember seeing there, a little cup-shaped oyster with a fluted shell. It grew in limited quantities.

MR. ARSENAULT : There are a great many different varieties of oysters. In Richmond bay alone, you will find several distinct kinds. Of these, the so-called Curtain Island oyster is considered the best. It is a cup oyster and no doubt is of the species which Mr. Beer has referred to. The smaller ones would, of course, be the young oysters, but when developed they sometimes reach a size of nine and ten inches across. However, those are too large to be desirable. Then there are the river or mud oysters, which are not cup-shaped. To get a good cup oyster a hard bottom is essential. If a mud bottom is used, the oyster will grow long and narrow in order to get above the mud. Good, hard bottom, well cleaned, is absolutely necessary for the production of the best oysters. Some of the mud bottoms in the Mississippi river have, I understand, been converted into hard bottoms, by the admixture of shore sand

with the mud. This mixture hardened and as long as it is not cultivated with any heavy instruments answers the purpose. But if one can secure good hard sand or pebbly bottoms, they will be found much more satisfactory. Some people are under the impression that one should have a bottom covered with shells. That is a mistake. The first thing to do with an oyster bottom is to clean it thoroughly. The only purpose served by the shells—"cultch" as they are called,—is to catch the "spat." The cultch,—shells, broken crockery, or any other hard clean materials are used—should be placed on the bottoms as near to the time that the spat settles as possible. If the cultch is put down too soon, it will get slimy and the oyster spat will not attach itself to it. Oyster eggs are invisible to the naked eye. They float on the water until they develop sufficient size, then sink to the bottom, where they attach themselves to the cultch by means of a particle of cement, which is secreted at the end of the foot of each young oyster at the completion of the free-swimming stage. If no cultch is available, they (the spat) will die.

MR. BEER : How many barrels to the acre is an average annual yield, covering a period of several years ?

MR. ARSENAULT : One might plant with the small oysters say one hundred, or one hundred and fifty barrels of second year oysters to the acre. In two or three years one could take from that acre from three to four hundred barrels.

MR. BEER : Is that all at one time ?

MR. ARSENAULT : That is, if one plants a second year oyster, then in two or three years that oyster is taken off and none are left. In actual practice, a number of beds are utilized, so as to insure a crop each year. Thus, one bed is planted and another is taken up every year. Then, there are special areas in which cultch is placed in order to catch spat. That spat is later taken up and planted elsewhere. One has to cultivate an oyster area as carefully as one would a farm.

MR. BEER : Would one hundred barrels to the acre be an average yield, with proper cultivation, year after year ?

MR. ARSENAULT : You could average one hundred barrels an acre easily.

MR. BEER : It would give the oyster area a very high value from a producing standpoint.

MR. ARSENAULT : Yes, but, of course, one must remember that one cannot expect to get \$12.00 or \$13.00 a barrel at all times. I think a very fair average price would be \$7.00 or \$8.00 a barrel, which would mean large profits.

THE CHAIRMAN (Mr. Sifton) : I am sure that it has been very gratifying to us to listen to Mr. Arsenault's remarks, as they provide definite and categorical proof that some of the things which this Commission has been doing have borne fruit. One of the first things the Commission did was to have a report prepared on the oyster industry. This was done by Mr. Patton, one of our officers, a very capable man, who, I am sorry to say, has left the service of the Commission. He prepared a very excellent report. A little study shows that the oyster industry has developed wonderfully in those places where it has received systematic attention, as it has in Connecticut and some of the other Atlantic states, particularly Louisiana. Since that report was issued, the Commission has been endeavouring, from time to time, to improve conditions for oyster farming, and it now looks as if the province of Prince Edward Island were going to lead in the resuscitation and rebuilding of the oyster industry. There is no reason why it should not obtain just as great and profitable a production there as it has attained in Connecticut and in Louisiana where the industry brings millions to the people. For myself, I express the hope that our friends from Nova Scotia and New Brunswick will endeavour to see that their governments take steps in the same direction.

DR. C. C. JONES : They have in New Brunswick, except in Kent county.

DR. HOWARD MURRAY : A move has also been made in Nova Scotia in the same direction.

THE CHAIRMAN : The success of the Prince Edward Island oyster farmers will doubtless prove a great incentive to those in Nova Scotia and New Brunswick.

We shall now have the report of the Committee on Press and Co-operating Organizations which will be presented by Mr. N. B. Wormwith.

PRESS AND CO-OPERATING ORGANIZATIONS

The publicity work of the Commission, which is under the direction of this Committee, divides itself into three parts, *first*, the issuing of reports embodying the results of the investigations of the various members of the staff of the Commission ; *second*, the issuing of the monthly bulletin, "Conservation," to the newspapers of Canada ; *third*, public platform work.

Reports

The following table gives details regarding the number, size and cost of the various publications issued during the past year :

PUBLICATIONS ISSUED, 1913

PUBLICATIONS	No. of Pages	No. of Copies	Total Cost	Cost Per Volume
1. Fourth Annual Report.....	238+VIII	12,000	\$ 4,507.20	\$.380
2. Six "Separates" from above report :				
Insect Food of Fresh-Water Fishes.....	12	300	27.50	.090
The Biological Board of Canada	14	300	18.50	.060
Oyster Farming in P.E.I.....	14	500	36.50	.070
The Smoke Nuisance.....	19	300	32.00	.106
Agricultural Survey, 1913....	22	300	17.00	.050
Salmon Fisheries of B. C.....	13	200	30.00	.150
3. Water-Works of Canada.....	114+IX	5,000	1,842.67	.368
4. Long Sault Rapids, St. Lawrence River.....	384	12,000	7,397.05	.616
5. Refuse Collection and Disposal.	12	170,000	973.11	.057
6. Fur-Farming in Canada.....	166+VIII	13,000	6,913.02	.531
7. Forest Protection in Canada, 1912.....	174+X	12,000	4,657.03	.388
8. The Canadian Oyster.....	159+X	10,000	4,094.50	.409
9. Conditions in the Clay Belt of New Ontario.....	36	3,000	144.00	.048
10. Catalogue of Publications, Revised to December, 1913....	35	4,000	254.00	.06
	Total No. of Copies	Average Monthly Circulation	Total Cost	Monthly Cost
"Conservation" (monthly).....	56,200	4,683	978.89	88.99

In addition to the above, a report entitled "Trent Watershed Survey," by Dr. C. D. Howe and Mr. J. H. White of the Faculty of Forestry, University of Toronto, with an introductory discussion by Dr. B. E. Fernow, is almost ready to leave the printer's hands.

A report by Mr. W. J. Dick, on "Conservation of Coal in Canada," is in press.

A revised and enlarged edition of the report, "Fur-Farming in Canada," is in preparation for the press.

The widest possible circulation is given the various reports of the Commission, while, at the same time, waste in distribution is carefully avoided. The names on the distribution list now number 13,300, and comprise such classes as newspapers, libraries, universities, boards of trade, judges, lumbermen, agricultural societies, medical health officers, municipal officials, engineers, societies and individuals interested in minerals, fisheries, etc., etc. Care is taken to see that the reports are placed in the hands of those specially interested in the subjects covered. For example, the forestry list includes 2,500 special names,

the mining list 2,300 special names, the agricultural list 2,350 special names, etc., etc.

Press Bulletin "Conservation," the publicity organ of the Commission, which was published for eight months during 1912, has, during 1913, been issued monthly. Its short, succinct articles containing the pith of investigations in the field by the experts of the Commission and editorials on all manner of subjects of interest to the conservationist are being copied by the press in all parts of Canada. Frequently, the issue is enlarged to a special edition of six or eight pages. Its circulation has been increased from 2,250 to 6,700 per month. Hitherto the bulletin has been sent to newspapers only, but during the past year its circulation was enlarged to cover the rural clergy, so that it now reaches all clergymen in centres of 2,000 population or under.

A feature of the publicity work of this Committee, which is rapidly increasing in popularity and usefulness is the loaning to the newspapers, trade papers and magazines, of the half-tone engravings used in illustrating "Conservation," and the various reports issued. This service has been extended by having electrotypes made from the copper-plates at a small cost, and in this way the Commission is enabled to meet the demands of journals in every part of Canada.

Platform Work No system for the furthering of this branch of the Committee's work has yet been organized but during the year, the Chairman, Assistant to Chairman and Medical Adviser addressed associations on conservation in various parts of Canada, in the United States and Great Britain. The Agriculturist and travelling instructors of the Commission gave many illustrated addresses during the year, at various centres where the illustration farms are located.

THE CHAIRMAN : Mr. J. B. Challies, Superintendent of Water-powers for the Dominion, has prepared a memorandum for this meeting with respect to the water-powers of the lake of the Woods watershed. As Mr. Challies found it impossible to be present, I am asking Mr. James White to read the memorandum.

MR. WHITE : This paper has reference to the watershed of the lake of the Woods. You are doubtless all aware, that the city of Winnipeg and practically the whole of southern Manitoba must depend largely on the water-power of the Winnipeg river for all their electric energy. It is quite true that there are other water-powers in the northern portion of the province which are susceptible of

development but the water-powers of the Winnipeg river are the most immediate and most economical within transmission range of the city of Winnipeg to-day. This area is altogether underlain by Laurentian rock which, as you all know, is all granite and gneiss. The peculiarity of such a country is that the flood run-off of all streams in it is unusually high. Such streams have very great extremes of flow and this is decidedly detrimental to their use in the development of electrical energy. It is true, that they have two large reservoirs, the lake of the Woods and Rainy lake, through which their waters flow, but the situation is very much complicated by the fact that these are international waters, and it is not possible to put in dams which will unduly raise the waters of these lakes. So Mr. Chalmers has filed this paper in which he puts forward a plea for the segregation, as a forest reserve, of the area in Canada draining into the lake of the Woods, so as to render the run-off as uniform as possible.

NECESSITY FOR A FOREST RESERVE IN THE LAKE OF THE WOODS DISTRICT OF ONTARIO

The question of cheap power is to-day one of the most important economic questions occupying the attention of those interested in the industrial development of our country. The main source of cheap power in Canada is dependable water-power. Fortunately, all the present main industrial centres—excepting probably a few cities in the Western prairies—have abundance of available water-power within feasible transmission distance. The best conservation of these water-power resources involves their early development, under proper governmental control, in a way that would realize the maximum possible, advantageous utilization of the power for this and future generations.

Water-power Administration The water-powers in Manitoba, Saskatchewan and Alberta are administered under regulations brought into force in June, 1909, pursuant to section 35 of the Dominion Lands Act, and provide for the most accepted principles of conservation, namely: limited grants, control of rates, reasonable rentals, maximum possible utilization of the resource, and at the same time offer to the investing public a reasonably sure and safe return on investment. These regulations are administered by the Minister of the Interior, through the Dominion Water-Powers Branch.

The active support of the Commission of Conservation to the question of scientific forestry in Canada has been of immediate and immense benefit in making the importance of the forestry work

of the Dominion and Provincial Governments appreciated. This movement has at the same time been of direct benefit to the water-power interests, because stream flow is so dependent on forest cover.

**Regulation of
Stream Flow**

The question of the adverse effect on stream flow of the denudation of forest cover is probably one of the most important matters occupying the attention of engineers interested in water-powers, irrigation, water supply, navigation, or any other activity depending on water. Not only must the question be considered from a remedial point of view but also with a view to preventing existing forest cover at the headwaters of important streams from being burnt or improvidently logged.

The particular situation in which I am officially interested is that in connection with the water-powers of the Winnipeg river. The headwaters of this river are in the province of Ontario, and include the lake of the Woods district. Fortunately this district abounds in large lake areas suitable for storage purposes, and the land areas are, so far as I am able to learn, fairly well covered with forest growth. Owing to the location of this forest cover in close proximity to the prairie country, it has already become a prey to the unscientific lumberman, and it is only a matter of time until the commercial timber will be removed. Unless the lumbering operations are properly supervised and restricted and reforestation provided for, the present facilities that this district offers for storage and conservation of run-off, will be dissipated.

**Forest Reserve
Recommended**

I am not aware that there is at the present time any forest reserve in the vicinity of the lake of the Woods district, and am convinced that it would be in the best public interest if the whole area were placed in a forest reserve, in order that all logging operations may be under strict supervision of trained foresters, and also that adequate reforestation may be arranged for. Such a reserve would probably be one of the most important in Canada, in so far as the water-power interests are concerned. While the Winnipeg river is at the present time one of the best naturally regulated rivers in the world—the extreme maximum flow being about four times its minimum—still it is possible to so regulate the river that its flowage will be practically uniform throughout the year. In horse-power this means that the low water flowage capacity of the river is about 237,000 h.p. in the province of Manitoba alone, which can be increased to a total of 409,000 of 24-hour horse-power, all within easy transmission distance of the city of Winnipeg.

The attention of the Commission of Conservation is called to this situation, with a suggestion that the matter of a proposed forest reserve be taken under consideration, and, if thought advisable, resolutions favourable to it passed and forwarded to the proper authorities of the Ontario Government.

Respectfully submitted,

(Signed) J. B. CHALLIES

Superintendent of Water-Powers

THE CHAIRMAN : It is interesting to know that the Winnipeg river which is referred to in the paper, furnishes all the power that is used for Winnipeg, and is practically the only power available for the district through which it passes. The point which Mr. Challies makes in his report for the preservation of the territory which forms the drainage basin, is of absolutely incalculable importance to the future of that district, because it is unquestionable that there will be in the Red River valley between the International Boundary line and lake Winnipeg, an immense population within a very few years and they have practically no other source of power.

That completes our work so far as the reading of papers is concerned. We shall now receive the resolutions prepared by the different committees.

Reports of Committees—Resolutions

COMMITTEE ON WATERS AND WATER-POWERS

HON. H. S. BÉLAND : Mr. Chairman, the Committee on Water-powers met yesterday afternoon and, although the attendance was not very large, still we came to conclusions with respect to certain resolutions. As the Commission already knows, the work of our water-power engineers has covered every province in Canada. During 1911, Ontario, Quebec and the Maritime provinces were covered and, during the last twelve or fourteen months, our engineers have made surveys of the water-powers in British Columbia and the Prairie provinces. The Committee, having considered the fact that a large portion of our water-powers are in the vicinity of the International boundary, deemed it important that some more data should be collected regarding boundary waters. The greater

portion of the population, in Canada, is resident near International waters. Take, for instance the St. John river, or the St. Lawrence river, and, farther west the Rainy river, the lake of the Woods water system, and then, farther west still, especially in Alberta and British Columbia, the St. Mary and Milk rivers, the Kootenay river and others. The Committee is of the opinion that some more work should be done on these waters ; that the Commission should gather information respecting the waters in Canada which have relation directly or indirectly with boundary waters. We have just been reminded by Mr. Challies' paper, that records of gauge-height and stream-flow constitute the basic data upon which all considerations respecting the use of water depend.

May I be permitted to speak for this Commission in expressing our gratitude to the Government of British Columbia, and especially to the Minister of Lands, Hon. W. R. Ross, for the very effective assistance and substantial aid he has given to our engineers. You will be very pleased to learn that in 1912 British Columbia appropriated \$3,000 for this work, and in 1913, \$5,000. I think it is only fair and proper that this Commission should express its gratitude to that Government.

The Committee on Waters and Water-powers recommend :

1. That all possible information respecting the waters in Canada, connected directly or indirectly with boundary waters should be collected and digested.
2. That the investigation of the St. Lawrence, undertaken with reference to the Long Sault rapids, should be extended to cover the whole river between slack water at Prescott and Montreal.
3. That, as accurate data respecting the flow of streams is absolutely necessary in developing water-powers, all existing information respecting gauge readings, measurements of stream flow and other cognate data in the possession of the Dominion Government, the Provincial Governments, corporations and individuals should be collated and published.

Recommendations received and adopted.

COMMITTEE ON MINERALS

DR. ADAMS : Mr. Chairman, as only a few days have elapsed since I was appointed to this Committee and as it is only a few hours since I was made its Chairman, it was agreed at a meeting of the Committee on Minerals yesterday that no formal report would be presented at this time. We hope, however, within the next few weeks to be able to carefully consider proposals put forward by the mining

engineer of the Commission, and by correspondence with the other members of the Committee, to reach certain resolutions which it will be desirable to communicate to the Chairman of the Commission. At the present time, however, our Committee have no report to make.

COMMITTEE ON LANDS

DR. ROBERTSON : The Committee on Lands beg leave to report the following resolutions :

1. RESOLVED, that the work of the Committee on the growth of alfalfa in the province of Quebec be continued during the season of 1914 to complete the investigation undertaken there.

2. RESOLVED, that the Committee be authorized to arrange for the selection of an Illustration Farm and the formation of a Neighbourhood Improvement Association in connection with each group of farms on which an agricultural survey was conducted in 1913.

These resolutions merely provide for carrying on the same lines of work that have been so successfully carried on by the Committee hitherto.

Resolutions received and adopted.

COMMITTEE ON PUBLIC HEALTH

DR. HODGETTS : I have been asked by Sir Edmund Osler to present the following report :

Your Committee on Public Health would recommend :

1. That the recommendations of the Commission as passed in 1911 be again approved, and that the same be submitted to the Honourable the Prime Minister.

2. The Commission of Conservation notes with pleasure the legislation which has been passed by several of the provinces of the Dominion in respect to town-planning and housing, whereby these two most important questions bearing upon the health of the people of Canada have been materially advanced, and desires to express the hope that they will pave the way to a sympathetic reception of the measures which will subsequently be presented for their approval by the special Committee now drafting Bills upon these two important questions.

3. That this Commission, having in view the large amount of technical information required for the use of those interested in questions of housing and town-planning, and believing that the same should be properly collected and made easily obtainable everywhere

in Canada, arrange at once for the elaboration of the information now on hand and provide for its extension along the most practical lines.

4. Whereas, an educational campaign is essential in the introduction and carrying out of any comprehensive scheme of housing and town-planning, your Committee would recommend that the opportunity afforded by the holding of the International City-planning Conference in the city of Toronto in the month of May next makes it opportune for the Commission to invite the attendance of representatives of the governments and municipalities of all portions of Canada for the purpose of organizing a Canadian Housing and Town-planning Conference to be held at least annually thereafter, under the auspices of this Commission.

5. Whereas, this Commission, having in view the fact that efficient administration of municipal affairs is essential to the material progress of our people and calls for a high-class of trained officials which it is impossible for the smaller municipalities to command ; therefore, be it

RESOLVED, that in the several provinces there should be established by each of the Provincial Governments a branch or department charged with the administration and control of all that relates to civics. Such a department to correspond to the Local Government Board of Great Britain, and that legislation be adopted suitable to the existing conditions, whereby not only the services of the best experts would be placed at the disposal of municipalities, but that all projects having for their object the raising of loans should only be passed after careful consideration and public enquiry.

6. That this Committee is of the opinion that the general health of the people of Canada would be materially advanced by the inauguration of a public health week along lines similar to that carried out so successfully in Great Britain, and would urge that immediate steps be taken for the inauguration and carrying out of such a project.

7. That this Commission, believing that the National Council of Women affords a most valuable medium through which to propagate the many questions of public health and thereby bring this portion of its work directly into the homes of Canada, take every opportunity to avail itself of the offer made by its Recording Secretary, Mrs. Plumtre, in her address before the Commission.

8. That this Commission is impressed with the necessity of the better education of our people upon all that concerns the health of a nation's greatest asset, viz., "the child." To this end the

Committee would recommend to all provincial health authorities the issuance of literature dealing with the various aspects of the subject and thus supplement the work of the Commission.

9. That this Commission, considering the spread of education in first aid to the injured a wise measure of conservation of life and efficiency, would recommend to the governments of the several provinces the advisability of some financial assistance in this voluntary educational work, along the lines of the grant made by the Government of the province of British Columbia.

THE CHAIRMAN : One remark as to the programme of our Committee on Public Health ; it is very extensive, but it is all good and we will have to have an understanding that we will do as much of it as we can, because we certainly will not get it all done this year. There is nothing like having high ideals.

Report received and adopted.

COMMITTEE ON FORESTS

DR. FERNOW : The Committee on Forests finds that, since the last annual meeting, the situation, to which its recommendations at that time referred, has changed but little, and that it can with propriety repeat most of the propositions then formulated, with some additions.

1. The protection from forest fires, in which a decided progress has been made, still requires assiduous effort to make it effective in all directions.

2. The matter of fire-protection along Government railways should be further taken up with the Dominion Government, and such railways should be made subject to the fire regulations prescribed by the Board of Railway Commissioners for lines subject to its jurisdiction.

3. Representations should be made to the Governments of Nova Scotia, New Brunswick, Ontario and Alberta, urging that both legislative and administrative provision be made for requiring provincially chartered railways to take adequate steps to safeguard the adjacent country from fires due to railways.

4. The ascertainment or inventory of timber supplies has been properly begun in British Columbia, in co-operation with the Provincial Forest Branch and with the Forestry Branch of the Canadian Pacific railway, and in Saskatchewan in co-operation with the Dominion Forestry Branch. This work should be persistently continued. Co-operation of the Provincial Government of New

Brunswick for the same purpose should be encouraged, and the Governments of Ontario and Quebec invited to pursue a similar course.

5. The attention of the Dominion and Provincial Governments should be again drawn to the vital necessity of withholding from settlement all lands which can not properly be classed as agricultural and of setting such lands apart for the permanent production of timber supplies. The importance should be especially accentuated of reserving and protecting from fire the vast areas of young forest growth, in order that they may reach merchantable size and form a future source of local revenue and industry.

6. The Governments of Ontario and Quebec should be urged to undertake a systematic classification of land in the 'Clay Belt' in advance of settlement, in order to have settlement properly directed.

7. A strong effort should be made to secure co-operation between the Dominion Government and that of the province of Ontario, to solve the problem of protection and recuperation of the Trent watershed.

8. The extension of forest reservations in the public lands of the west should be forwarded, as the surveys by the Dominion Forestry Branch develop their desirability.

9. The organization of forestry branches should be urged on the two forest provinces, New Brunswick and Nova Scotia, which are still without such an agency.

10. The Commission reiterates its opinion that, in the forest services of the Dominion and Provincial Governments, more than in any other service, the appointments should be based on capability and experience, such as may be secured by civil service examinations.

11. Representations should be made to the Dominion Government looking toward the adoption of some plan, whereby adequate provision may be made for the enforcement of the technical provisions affecting lumbering operations on the licensed timber berths.

12. The immediate establishment of a game preserve in the southern portion of the Rocky Mountains, in Alberta and British Columbia, adjacent to the Glacier National Park of Montana, should be urged upon the Dominion Government and the Government of British Columbia. Immediate favourable action upon this recommendation is imperative in the interests of game preservation.

13. In the opinion of the Committee, an expenditure of \$25,000 per annum for the next four years is urgently needed, to furnish

the basis for formulating and forwarding a forest policy for the Dominion.

14. In view of the importance, for water-power development, of the forest cover on the upper waters of the Winnipeg river and especially on the watershed of the lake of the Woods, steps should be taken to segregate as a forest reserve the area drained by this river.

15. Whereas the Commission has recently sustained in the death of the late Frank Davison the loss of one of its most active and valued members : be it therefore

RESOLVED, that the Assistant to the Chairman convey to the members of his family our expression of sorrow and deepest sympathy in their loss.

Report received and adopted.

FISHERIES, GAME AND FUR-BEARING ANIMALS

DR. C. C. JONES : The Committee had a fairly lengthy session and discussed the fisheries situation quite carefully. I may say that we are very strongly of the opinion that immediate steps should be taken to try in every possible way to secure the services of a competent expert for the Committee in its work. We feel that there are some exceedingly important investigations that should be carried on in connection with the work on fisheries, but that it is impossible now to carry on these investigations in any definite way, owing to the absence of any paid expert, who can carry out the wishes of the Committee in the matter of these investigations. The Committee submits the following resolutions :

1. RESOLVED, that the Commission re-affirm the resolutions of last year dealing with the reorganization of the Fisheries' Service and the provision of instruction for fishermen, viz. :

(1) Whereas, the present fisheries protective service is admittedly susceptible of much improvement : Therefore be it

Resolved, that the immediate necessity of a reorganization of the service be called to the attention of the Minister of Marine and Fisheries and,

That in our opinion the following considerations should be recognized in such reorganization :

(a) The desirability of employing permanent officials paid sufficiently large salaries to enable them to devote their whole time to the work.

(b) The advantage of having each official, on appointment, a stranger in the district to which he is appointed, and, where practicable, of having him removed to a new district periodically.

(c) The immense gain in the efficiency of the protective service in having all appointments made on the sole ground of the capability of the appointee to discharge the duties of his position.

Resolved, that in the opinion of the Commission the Government of Canada should provide or assist in providing as soon as practicable, adequate instruction for fishermen in the pursuit of their calling in a similar way to that in which it is providing instruction for farmers ; and, further,

That the Biological Board of Canada be reorganized so as to provide for the permanent employment of a staff of scientific fisheries' experts thereon.

2. RESOLVED, that the Commission urge upon the Dominion Government the desirability of appointing a Deputy Minister of Fisheries, to devote his whole time and energy to the development and improvement of this important industry ; and further, that a Fisheries' Agency be established in each of the Maritime Provinces along lines similar to the Marine Agencies already existing, and in order to secure the prompt despatch of business, that as much power be delegated to these agencies as is consistent with the proper administration of a Department of the Government.

3. RESOLVED, that the Commission urge upon the Department of Marine and Fisheries the advisability of a standardization of barrels and packages for pickled fish, oysters and other fisheries' products.

4. RESOLVED, that the Commission urge upon the Department of Marine and Fisheries the advisability of instituting an inquiry regarding the practice of other countries in curing and grading fish and in branding or stamping packages to indicate the quality of the fish contained therein, and, if possible, of devising some practicable means in connection with Canadian fisheries, of improving the methods of curing and grading fish, and of indicating on the packages the quality of their contents.

5. Whereas, the Commission of Conservation heartily approves the efforts now being made for the preservation of North American migrating birds, some of which are seriously threatened with extinction, now therefore, be it

RESOLVED, that the Provincial Governments of Canada be urged to solicit the good offices of the Dominion Government in

obtaining the negotiation of a convention for a treaty between Great Britain and the United States, for the purpose of securing more effective protection for the birds which pass from one country to the other.

Resolutions received and adopted.

MR. SNOWBALL : Possibly some of the members of the Commission will remember that at the last Annual Meeting I referred to the matter of salmon hatcheries. I think the suggestion made by the Committee that they should have a fisheries' expert in connection with the Conservation Commission is a good one. For instance, at our last annual meeting, I pointed out that there was a rumour going the rounds in the Maritime Provinces that some of the hatcheries were being supplied with fish taken in the autumn. When I returned to New Brunswick I made some further inquiries from fishermen and others having a practical knowledge of fishing. They informed me that the fish that were being hatched in the Miramichi and the other New Brunswick salmon hatcheries were the autumn fish. Fishing for salmon terminates on the 15th day of August. After that date, a small run of fish is caught for the hatcheries. The fish that we catch and export are not being hatched at the hatcheries in New Brunswick. This is an important industry. Salmon fishing is decreasing although we have had splendid hatcheries and good work has been done in the protection of salmon, but this autumn-fish is not a commercial salmon and it is protected by law. Still it is frequently caught, and the quality of the fish is quite apparent to any person who has seen a June, July or August salmon and has then had an opportunity of eating an illegally caught fish in September. I think the subject is one with which the Commission should ascertain what is being done in these hatcheries. This would be work for a fisheries expert.

DR. C. C. JONES : One could enquire from Mr. W. A. Found, Superintendent of Fisheries. I could ask him to enquire into the matter.

PRESS AND CO-OPERATIVE ORGANIZATIONS

MR. MCKAY : Mr. Chairman, our Committee's work has been outlined in the report which Mr. Wormwith has read. The Committee on Press and Co-operating Organizations is the clearing house for the work of the other Committees. I am sure I speak for every member of the Committee when I say that we are all proud of the admirable reports that have been issued by this Commission. So far

as reports and statements can go, I think they are pretty nearly ideal. They are written in a popular style and I believe they are meeting the purpose for which they were issued. In that connection, it would be an advantage to have them issued in larger numbers so as to further increase their usefulness.

Before I go further, I wish, on behalf of the Committee, to endorse what our Chairman has said in reference to the departure of Mr. Patton, who was a very valued member of the staff. We were sorry indeed to lose him.

There is one branch of our work to which more attention might be devoted, and that is co-operative organizations. That is part of the work of this Committee, but I do not think that we have been very active in pursuing it. There is an almost infinite number of organizations which might be induced to co-operate in the work of the Commission of Conservation, especially now that we have so much valuable information. I am sure that we all listened with great pleasure and with some surprise to the remarks of Mrs. Plumptre yesterday. It was very gratifying indeed to have her offer the services of the great body which she represents to carry out this work, and we were also surprised to find that they knew so little about the work which the Commission of Conservation is carrying on. I really feel that something might be done in enlarging the scope of the Commission of Conservation. I say—and I think I speak for the Committee, although only one other member of the Committee is with us on this occasion—that something might be done in the way of engaging another expert. I think that perhaps a greater degree of publicity might be obtained for the work of the Commission, especially along the lines of inducing other organizations to co-operate with the Commission in spreading the gospel of conservation. That work could be done probably most effectually on the platform if we had an expert whose time was always available for work of this kind and who would be the representative of the Commission. We are all willing to pay honour to the great work that has been done by our Chairman along this line. But he is a very busy man and we cannot expect that he will go on continually giving up so much time to addressing bodies anxious to hear about the Commission's work. Without doubt it would involve a large expenditure of money and we hesitated to suggest it. We think, however, that it would be justified, if a suitable man could be secured.

We also would recommend that the various members of the Commission devote as much of their time as possible to publicly advocating and explaining the work of the Conservation Commission.

We must not forget that this is a democratic country and that we must depend on public opinion for the very existence and development of the work of this Commission and we must studiously avoid degenerating into a bureau for the mere fying of information. The reports may look very well in a library, but so long as they are on shelves they are doing no good. We must get the people to read them. That is one danger that the Commission must avoid, and we would, therefore, recommend that, within the limits of their time, the members of the Commission appear in public, advocating the principles of conservation.

The Committee desires to present the following resolution :

Whereas, the Conservation Committee of the National Council of Women, through its representative, Mrs. Plumptre, has declared its willingness to co-operate with the Commission of Conservation in diffusing information with respect to housing, town-planning and other conservation activities : Therefore be it

RESOLVED, that the Commission express its appreciation of the overtures of the National Council and that the Committee on Press and Co-operating Organizations be authorized to take steps as may seem desirable to make such co-operation effective.

Resolution received and adopted.

THE CHAIRMAN (Mr. Sifton) : This terminates our meeting. I feel that we have had a very pleasant and profitable gathering and I feel very much more encouraged in regard to the general progress of our work, and the general acceptance of the ideas we advance, than I have felt in the past.

I have to thank all the members of the Commission who have been asked to co-operate, for the cordial kindness and assiduity with which they have worked, and the assistance they have given in carrying on the work. I trust that the country shall have a successful and profitable year.

The Commission then adjourned.

Appendices

I. Protection of Birds

AT the General Assembly of the International Agricultural Institute, held at Rome, in May, 1911, a report on the "Protection of Birds" was presented by M. E. de Miklos, Secretary of State for Agriculture, Hungary. The General Assembly approved M. de Miklos' report and adopted the following resolutions :

1. The General Assembly notes that twenty states have by law agreed to the effectual protection of useful birds, and is pleased to find that three of these states have taken this course in consequence of the resolution adopted in 1909 by the General Assembly of the International Agricultural Institute.

2. In view of the great importance to agriculturists of such protection, the General Assembly decides to communicate to the adhering states the information received on the subject, with a request that they may complete the protection, and, in the case of states where none yet exists, that they may take the necessary action to establish and create a general feeling in favour of the protection of useful birds.

3. The General Assembly considers it necessary to keep the subject in view, and authorizes the Permanent Committee to remain in touch with the various governments, in order that the committee may be in a position to inform the next General Assembly as regards the progress which has been made.

M. de Miklos' report is as follows :

An eminent person, M. Otto Herman, has stated that the protection of birds has a quite natural origin ; it is, in fact dictated by considerations of their life and condition, and, from the human point of view, by the question of profit and loss.

It is comparatively recently, in 1902, that certain countries in central Europe agreed to the International Convention of Paris, in favour of the protection of birds. Unfortunately, only a few governments agreed to it, but, if its results have been small, it is mainly because authorities and specialists in the respective countries have considered the subject only from their standpoint, and because local interests have been at variance with those which are general and universal.

It is not the intention to write a treatise on ornithology ; that is not our business. But as agriculturists, who are ever striving to

counteract the vagaries of nature to which we are exposed, every means supplied by biological observation and science must be employed—without ignoring the protection to which birds have a right—in order to demonstrate the importance of the subject in the economy of nature and mankind.

When the land is still in its primitive state, with a virgin soil, there can be no distinction between the birds which are useful and those which are not, because the balance of nature acts automatically. But, when touched by the hand of man and the cultivation of the soil alters the conditions, the species of birds vary in proportion to their available means of subsistence.

The preceding observations indicate the reason for the continued decrease in number of certain birds, and the increase of others, as well as for the periodical appearance and disappearance of birds. Moreover, variations of climate and of the conditions of existence cause birds to migrate ; they leave northern latitudes *en masse* in the winter to take refuge in the temperate zone ; and other birds, forsaking that region, fly still further south. This sketch gives a sufficient idea of the importance of this bird-movement, which is amply demonstrated by the work which is done by the birds—results which neither nature nor man can discard or replace in a world so wisely governed by divine laws.

Insects and plants, in particular, are affected by the controlling effect of the action of birds, and agricultural experience teaches that certain operations which are essential to the soil, can only be performed by birds. But, as civilization may affect the course of nature, and transform the relations between land and water, so also may the conditions of existence of plants and animals be changed.

The intensive cultivation of the soil, and the various systems of cattle breeding on a large scale offer to the lower animals—and especially to insects which depend on the productions of the soil—the most favourable conditions of existence, and favour their increase to an almost incredible extent. This matter is of serious concern to mankind. It is an ever-increasing danger which must be resisted by the best and most natural means which are available.

Human interests demand, unconditionally, that useful birds should be protected and that the destruction and increase of injurious ones should be controlled. This protection of the useful birds depends on the supply of conditions necessary for their existence and increase.

On account of the diversity of geographical position and consequently of climate, plants and animals exist under different condi-

tions, and the important influence of birds on agriculture in general must not be regarded merely from a single and local point of view.

For instance, the further north one may go—into the polar regions—the smaller is the number of species of birds but the more numerous are the birds of certain species—a fact which is, indeed, in perfect harmony with the impressive simplicity of nature in those parts. On the other hand, the nearer to the equator, the greater the number of species, with a diminution in the number of birds of each species—a fact which, again is in harmony, with the gorgeous aspect of nature in tropical countries, and especially with the diversity of plants and small birds. A consideration of these things leads to the following conclusion, which is only relatively true, viz., that the importance of birds must be estimated according to the position and nature of the various countries. A bird may, in fact, be useful in one zone and injurious in another. Take the case of the starling, which is judged very differently in the districts where it is found. Where cattle breeding exists on a large scale, the starling frees the animals from parasites, and in the grass districts it lives on insects ; but it is an injurious bird where the form of cultivation is intensive and where fruit abounds.

The natural increase of birds is counteracted by their destruction in various ways, which may be classified into three categories :—

(1) The natural process of destruction by the lesser *carnivora* and birds of prey, particularly those which feed on eggs ;

(2) Natural causes, which more particularly affect migratory birds, since they must fly across the ocean to return home. These causes of meteorological character, *e.g.*, absence of food due to severe winters, heavy storms, or dense fogs which cause the birds to lose their way.

(3) The intervention of man, an agent who, endowed with the highest intellect, is also the least considerate.

The first two categories form part of the process of natural selection. Man can intervene only in the first by controlling the number of the natural enemies of birds, but in respect of the second : “The act of God,” he is powerless—except perhaps in the case of famine resulting from cold weather, since its effects may be attenuated to some extent.

Wilful destruction of birds by man and the means of prevention will now be considered in connection with the third category.

Southern Europe, including Russia as far north as Moscow, that is to say, the countries which are traversed by migratory birds, are inhabited by people belonging to the Latin, Slavonic, Levantine,

Turkish and Greek races. They have been inveterate bird-eaters from early times, and they consequently possess a large variety of traps and weapons for capturing birds. The cruel passion for killing birds is also deeply rooted. In some districts, nets are used to an almost incredible extent. Improved methods of transport have facilitated the carriage of large quantities of live birds, which are mainly sent to Central Europe, where they form the staple of a flourishing trade, of which the results have encouraged the people of the Mediterranean to follow suit. In Northern Africa, particularly, it is the colonists, and not the natives—whom it is the fashion to regard as “savages”—who spread the nets in which are caught large numbers of migratory birds, which are thence despatched by sea to Central Europe, there to satisfy the gluttony of those whose appetites are of more importance than anything else.

The International Ornithological Congress which was held at Budapest in 1891 supplied particulars of the veritable slaughter of these unfortunate migratory birds. Without entering too closely into details, it is advisable to quote a few figures.

According to information furnished by Professor Vallon, duty was collected at the Brescia custom house in 1890 in respect of 423,800 small birds. They were principally fly-catchers, warblers, white-throats, pipits and tits, that is to say the species most useful to agriculture. During one season of migration 200,000 birds were despatched from Udine by railway alone. More than 14,000 swallows were caught near Montegrado, and three millions of these birds were taken in one season in the Crau district.

Egyptian statistics show that 500,000 quails were exported in 1887, 1,235,000 in 1888, and 900,000 in 1889, *i.e.*, about 2,635,000 quails (official figures) were sent to Paris and London in three years. One consignment of 114,000 larks is officially reported as having been received in Paris. M. Comte Salvadori, the eminent Italian ornithologist, has calculated that by means of a single one of his traps—the “roccolo”—135,485 small birds can be caught in the course of twenty years.

These few figures, which are easily verified, give an idea of the slaughter in which the inhabitants of certain countries participate during the migratory season. The bird victims of feminine fashions, moreover, are numbered in millions, and one single shop in Paris has used 400,000 larks' wings from Finland.

No reference has yet been made to humanitarian sentiment ; we are regarding the fact that the bird and its work are being sacrificed for the profit of certain material interests, and that this irrational

destruction by human agency can best be opposed by the consideration of agriculture in general, on which depends the food of man.

If this universal consideration alone sufficed to impede the wanton destruction of birds, there would still be room for legitimate feelings of pity, which must always be encouraged. If there is one subject in this world which can be settled only by an international understanding, it is surely the question of rational protection of birds. This, moreover, is the unanimous opinion of men who speak with the experience of many years.

The disappearance of birds, generally recognized as useful to agriculture, from districts which have been their habitat from early times, is a fact which becomes more and more apparent, particularly with respect to migrants which do not return to their old haunts in the spring, although the local conditions have not sensibly altered. The only possible explanation is that the whole flight has been captured during its migration through the bird-eating countries, where the birds have fallen victims to the greed of the people.

This fact alone would justify international measures, because birds thus captured *en masse* during migration do not breed in the districts where they perish. Protection is, in this respect, absolutely necessary for agriculture in general, since migration takes place from the far north to the equator, and the whole world is interested.

It was during the second half of the 19th century, subsequent to the development of intensive agriculture, that insects began to increase in an alarming manner. It was observed by German farmers and foresters—who were the first to take public action in the matter—that this increase corresponded directly with a marked decrease in the number of useful birds. The necessity for international action for the protection of birds useful to agriculture and horticulture was duly recognized at the twenty-sixth General Assembly of German Farmers and Foresters, which was held in 1868.

That meeting referred the question to the authorities of a neighbouring country and, in the year mentioned, the Austro-Hungarian Minister of Foreign Affairs was requested to arrange with the other European countries a convention for the protection of birds useful to agriculture and to arboriculture. This is the reason why the initiative in this matter rests with the Governments of Austria and of Hungary. They agreed after discussion, to limit their action to birds useful to agriculture, and to support, to that extent, the request of the German agriculturists.

It is only natural that the idea should have originated in Germany where the people have been bird-catchers from time immemorial.

As early as the 13th century the Emperor Frederick II. (1194-1250) described his love for the sport in his interesting memoirs, "*De arte venandi cum avibus*." This natural characteristic ultimately led to the adoption of legislation ; e.g., in the Duchy of Lippe-Detmold in 1777 ; in the Duchy of Saxe-Cobourg in 1809 ; and in the Grand Duchy of Hesse in 1837. This very complete law of 1837 gave a long list of birds useful to agriculture ; it expressly prohibited killing or selling birds, and contained provisions for the protection of nests and fledglings.

The subject of international protection was broached simultaneously by two men who were unknown to each other, viz., the eminent German ornithologist, Eduard Baldamus, and the equally famous Hungarian naturalist, J. Salomon de Patényi. At a meeting of the first Ornithological Society held at Köthen in 1845, Baldamus proposed, without success, a resolution concerning the international protection of birds. He renewed his efforts in 1846, before the Saxon Economic Association, and again ten years later, at the second meeting of the German Ornithological Society, but also with negative results.

The serious damage caused by insects during the next few years fully justified the endeavours which Baldamus made, and they prompted the German farmers and foresters in 1868, as already stated, to request the Governments of Austria and of Hungary to take official action. The European Governments were consequently approached through the usual diplomatic channels, and Italy, whose participation was considered by the Hungarian Government as of the utmost importance, eagerly adhered to the proposal in March, 1869. The Federal Council of Switzerland also gave a favourable reply, but only as regards the Canton of Ticino, where the language is Italian, and then only in case the Italian Government extended its regulations to the whole of its territory. The French Government gave its support June, 1869, but pointed out that success depended especially on the participation of Italy, Spain and Switzerland.

Thus encouraged, the Austrian and Hungarian Governments continued the work with energy ; they decided, in consultation with the Ministry for Foreign Affairs, to abandon the idea of ensuring the protection of birds by means of international agreements which are very difficult to conclude, more especially on account of the legislation existing in certain countries. It was agreed that the more practical method was to summarize under the form of a convention certain general principles which the contracting parties might be willing to observe.

The various governments were informed accordingly—and, in 1872, the Federal Council of Switzerland suggested the desirability of summoning an international congress for that purpose. This proposal was supported by Germany, but the congress did not take place. Certain indications led the Austro-Hungarian Foreign Minister to fear that the adherence of Italy, which was the most important in this connection, might be prevented for certain reasons and he decided to conclude an agreement with that country in the first instance.

The Keeper of the *Naturalien-Cabinet* at Vienna, Chevalier Frauenfeld, was accordingly sent to Florence in 1872 with power to act officially with the delegate of the Italian Government, Professor Targioni Tozzetti.

These two experts drafted a convention embodying six points which, after slight alteration by the Austrian and Hungarian Governments, was submitted officially to the Italian Government. It was favourably received, but certain difficulties led to complete failure, opposition being especially pronounced by reason of the proposed prohibition of the use of large fixed nets for the capture of birds in large numbers.

Negotiations were continued until the opening of the Universal Exhibition at Vienna in 1873. The International Agricultural Congress was held at the same time, and the following question appeared in its agenda :—"What steps should be taken for the protection of useful birds ?"

The reporter, Doctor Tschudi, a well-known naturalist, who was then Swiss Minister at Vienna, eloquently demonstrated the value of the protection of birds. His proposals referred to nine subjects, and especially to the opportunity of an international understanding regarding the protection of small birds (not included in the game laws), the capture of which by means of traps, permanent nets ("roccolo," "bagnaja") or lime, should be prohibited. Details cannot now be given of the discussion in which many distinguished specialists took part ; *e.g.*, Dr. Alfred Brehm and Messrs. Torelli, Settegast, Rossi, Fédrigotti, Middendorf, Marenzeller, and others.

Continuing the historical retrospect, the matter took a decisive turn in 1874 through the intervention of the eminent Austro-Hungarian Minister for Foreign Affairs, Count Jules Andrassy, and it is due to his tact, and his profound knowledge and love of agriculture that certain results were obtained, especially in 1875, a declaration of which formed the basis for the Frauenfeld-Tozzetti agreement.

It was signed at Budapest on the 5th November, 1875, by Count Jules Andrassy, for Austria and Hungary, and by the Italian Minister of Foreign Affairs, Marquis de Visconti-Venosta, on behalf of Italy, on the 29th November, 1875. The two signatories also agreed to urge other governments to support the movement on the same lines.

Count Andrassy made it his duty to continue diplomatic efforts, and in 1876 he addressed the Governments of Germany, Switzerland, France, Belgium, Holland, Spain and Greece on the subject.

The political situation was then in a very disturbed state, and progress was further delayed because a definite list of the birds to be protected had not been included in the declaration. Germany held back awaiting ratification of its own legislation before entering into any agreement with other nations on the subject; and no practical result ensued.

It then occurred to certain experts, unrestrained politically or diplomatically, to re-open the question by convening the First International Ornithological Congress, which was held at Vienna in 1884 under the patronage of the late Archduke Rudolph, the heir-apparent, well known for his scientific and ornithological knowledge. The leading naturalists in Europe attended the meeting, and Dr. Bernard Altum, the distinguished professor at the Eberswald School of Forestry, acted as reporter to the congress. His detailed report was considerably criticised by the German members, and the congress finally adopted a resolution proposed by the delegate of Switzerland, M. Victor Fatio. He received strong support from M. Henri Giglioli, the delegate of Italy, who explicitly stated that the Italian Government would be guided by the agreement of 1875. This result was communicated to the Austro-Hungarian Minister of Foreign Affairs with a request to continue to urge the necessity for the protection of birds.

The second International Congress was held at Budapest in 1891. It had been postponed on account of the death of the Archduke Rudolph and also on account of the Paris exhibition in 1889. Twenty-eight countries, including the United States of America, were represented.

The congress unanimously adopted a resolution proposed by M. Maday, delegate of Hungary, who referred to the declaration of 1875 which ensured the co-operation of Italy, and he amplified its provisions by the addition of certain practical proposals.

This congress decided to ask the Hungarian Minister of Agriculture to take necessary action through the Austro-Hungarian

Minister of Foreign Affairs, with a view to the adoption by all countries of an international scheme regulating the protection of the birds which are necessary from a universal point of view.

M. Ladislas de Szogyeny-Marieh, head of division at the Ministry of Foreign Affairs, took up the matter and informed Count Andras Bethlen, Hungarian Minister of Agriculture, that he considered the moment propitious for arriving at an international solution of the question, because Germany, which had adopted new legislation relating to the protection of birds in 1888, would henceforth probably take a more active attitude.

The attention of the Minister of Foreign Affairs was drawn to Article 20 of the Hungarian Law of 1883, which had given excellent results as regards the protection of birds, as well as to certain foreign legislation of which the following *résumé* is given for convenient reference :—

Birds were not protected in any way throughout the vast territories of Eastern Europe, in Russia, or in the Balkans. The close season in Russia only lasts four months, *i.e.*, from the 1st-13th March to the 1st-13th July. Birds are, however, sent in great numbers to Moscow, and, especially in the spring, larks, quails, and tits are consumed in large quantities. This information is apparently at variance with a report made by Bachner at the Vienna Congress in 1873 when he stated that the close season for large birds lasted five and a half months and, for small birds, throughout the year. There is, it is true, an Imperial Association for the Protection of Birds, but it seems to be quite inactive. In Turkey, birds are not protected and their capture with lines, traps and lime, is a favorite sport, as well as by means of decoy birds which, fastened by one leg, attract others by their cries. The cruelty of the sport is somewhat minimized by setting free the captured bird, this being regarded as an act of virtue.

According to the information available at the time of the congress, the protection of birds was very lax in France, Italy and Spain. In France, indeed, all birds, without exception, have to run the gauntlet.

In Austria, the law on the protection of birds occupies fifty-five pages of print. It does not apply to Trieste, but the other parts of Austria are grouped as follows :

(1) In Istria, Dalmatia, the Littoral and the Tyrol, it is forbidden to destroy nests, but birds may be taken in the autumn and winter. Licenses, which vary in cost from 2 to 10 florins, are issued by the local authority.

(2) A license is necessary in Bukovina, Görz, Gradiska, Cracovia, Silesia, Vorarlberg and Northern Austria, where it is forbidden to destroy nests. An official list indicates the birds which are useful and those which are injurious.

(3) In Bohemia, Galicia, Carinthia, Salsburg, Styria and Southern Austria it is expressly forbidden to capture birds which are "useful," as specified in an official list. The capture of other species is allowed only under certain conditions.

Germany—The legislation of the 22nd March, 1888, contains the following provisions :—

It is forbidden to take, or to trade in, birds' eggs and nestlings, but it is permitted to take the eggs of birds which live on the sea-shore, *i.e.*, the gull, the kittiwake and the lapwing. Permission may, however, be restricted locally. In no case, however, is it legal to capture birds at night. The close season lasts from March 1 to September 15. The authorities have power to make exceptions in case of very severe damage. The law does not indicate the useful birds, but the destructive birds are partly enumerated in groups.

The local regulations are as follows :—

Prussia—Every person who, on private property, captures birds (or takes their eggs or young) not included in the term "wild birds" is liable to a fine of 30 marks.

Bavaria—The following birds are protected by the Royal Ordinance of November 19, 1889 : buntings, wagtails, "creepers," red-breasts, warblers, larks, chaffinches, tits, woodpeckers, etc., etc.

Wurtemberg—The Royal Ordinance of October 7, 1890, forbids taking the eggs of the black-headed gull and the lapwing in the Danube provinces. The birds which are protected are as in Bavaria, with the exception of the white and the black storks, which are considered destructive.

Saxony—The law of July 22, 1876, forbids the capture of larks, thrushes, and all small singing birds, at certain seasons. The law does not deal with crows, wild-doves, sparrows and nut-crackers.

Baden—The law protects practically the same birds as in Bavaria. Of the thrush family the fieldfare alone may be captured.

Hesse—The law for the protection of birds is one of the oldest in existence, dating from April 7, 1837. It prohibits the killing of birds useful to agriculture, or taking the eggs or fledglings. The sparrow and the crow are exceptions, and others may be made in the interests of science. A means of protection which is original and unique of its kind is the prohibition of the trimming of hedges between August 1 and March 1.

Alsace-Lorraine—Useful birds are protected and, contrary to the laws in other parts, the protection extends all the year round to crows, thrushes and starlings.

So far as we can trace, there exists, in addition to the Imperial laws, special local legislation which is sometimes contradictory.

Switzerland—The law relating to the protection of birds is contained in the Game Regulations (paragraph 4), which protect all insectivorous birds, all species of finches, larks, starlings, thrushes, except the fieldfare, and goldfinch. The crow, common buzzard, thrush, kestrel, owls are also protected, but not storks or swans. The birds indicated, as well as their eggs, are protected absolutely. Sparrows, starlings and thrushes, which attack the vineyards may, however, be killed by the proprietor up to the time of the vintage. The capture of birds of all species is prohibited. The law (paragraph 18) provides for the teaching and inculcating to children in the communal schools of the advantages to be obtained by the protection of birds.

Belgium—The "Règlement d'Administration Générale" of March 1, 1882, contains the following information : (a) the species of birds which, with their eggs and nests, are protected all the year round ; (b) the species which can only be captured during the partridge-shooting season ; (c) the species which can be captured all the year round, e.g., nut-crackers, magpies and wild doves. The transport of finches is permitted if the possessor can prove officially that the birds belong to him and that they are not an object of trade. The use of decoy birds, lime and traps is prohibited.

Holland—The law protects birds useful to agriculture and to forestry, together with their eggs and nests, according to the following classification : (a) birds which are useful at all seasons ; and (b) birds which are useful during the first nine months of the year. Group (a) includes insectivorous birds, blackbirds, larks, etc. ; and

(b) group includes the finches and buntings. The law contains no provision in regard to ditches and inclosed spaces, and makes no exceptions in favour of scientific studies.

England—The Wild Birds Protection Act, 1880, which applies to Great Britain and Ireland, prohibits the shooting or capture of all wild birds, and the use of traps or other instrument for that purpose, between March 1 and August 1. The possession of wild birds after March 15 is also illegal. A contravention of the law as to any of the eighty-five species mentioned therein involves a maximum penalty of £1. As regards other species, the Act of August 10, 1872, still applies, the culprit being liable to a warning and the costs of the action, and on repetition of the offence to a maximum penalty of five shillings, with costs, but no fine can be imposed if it is proved that the bird was taken during the shooting season, or that it was imported. This legislation does not affect land-owners or their representatives, to whom an Act of August 22, 1801, is applicable.

Norway—Legislation refers to native birds only, such as the tufted duck and the grouse. The capture of small birds by any means is forbidden.

Hungary—There are 132 species of useful birds protected by laws passed in 1883, 1894, 1901 and 1906.

It is advisable to give a brief summary of the communication made at the Second Ornithological Congress at Budapest by Baron Hans Berlepsch, the celebrated German ornithologist, and M. Otto Herman, the Hungarian naturalist, whose reputation is universal.

According to the inquiries made by these two specialists, the chief reason for the considerable diminution in the number of birds, apart from the difficulties of nesting owing to the extension of intensive agriculture, is the capture and destruction carried on to an almost incredible extent by the inhabitants of southern Europe. From 1885 to 1890, Baron Berlepsch investigated the methods employed for the capture of migrants in Switzerland, Italy, southern France, Corsica, Sicily, Algeria and Tunis.

It is forbidden to capture birds in flocks by means of nets in Switzerland and the South of France, where it is, however, permissible to shoot them with firearms in the autumn. The inhabitants use—indeed, abuse—this privilege. At that season one meets everywhere along the roads “sportsmen” who shoot birds perched on trees or on the telegraph wires. This cruel pastime is not the work of children

but of men who are proud of their exploits. The greatest destruction is, however, caused by other means. A system employed in Italy consists of three nets of about one thousand yards in length and from one to thirteen feet wide. The nets are used in conjunction with trees, and the system, known as "roccolo," is permanent and takes some years to establish. Horseshoe in form, it is surrounded by quick-set hedges, with openings facing each other where the nets are placed.

The migrants are attracted into the trap by means of decoy birds, which have been most cruelly blinded by means of heated wire. When the birds approach the "roccolo" the bird-catcher throws up a kind of disc plaited round with willow branches and furnished with a short handle. Mistaking the device for a sparrow-hawk, the birds drop into the "roccolo" and are caught in the nets.

The "pressanella" and "passata" are traps of the same kind. They vary in size and are very largely used throughout the north of Italy, where they are erected wherever the ground is suitable. The largest are huge concerns which combine every kind of trap. They are found especially in the neighbourhood of lakes Maggiore and Lugano, where they cover an area of between one and one and a half kilometres. Above the traps, tall poles are erected from which are suspended small cages containing blinded birds which attract the migrants by their cries. The birds include goldfinches, linnets, greenfinches, redbreasts, chaffinches, sparrows, blackbirds and uncommon buntings.

Baron Berlepsch recorded the following figures towards the end of the autumn in north Italy: the bird-catcher threw the "roccolo" once and drew 100 goldfinches into the net, at a second throw he obtained about 130 blackbirds, 60 chaffinches and 20 willow-wrens. A single bird-catcher may thus capture about 500 birds every morning in the autumn, the number may reach 2,000 in September, sometimes including as many as 800 redbreasts. Allowing an average daily catch of 200 birds, the total at one spot may be 15,000 during the season of two and a half months. All the birds caught are useful to agriculture. It follows that the birds captured in Italy are to be counted in millions, and the number is increased considerably if Greece and Spain, where the practice obtains in the same proportion, are included.

Bird-catching on a smaller scale, *e.g.*, by means of branches covered with lime, obtains to a considerable extent in Italy, Sicily, Corsica, the South of France, Algeria and Tunis. In the two last-named countries, the white people are the culprits—not the Arabs—

who, indeed, protect the birds. The smaller traps, and other simple means of capture, cause great damage among the most useful species, such as redbreasts. In the south of France the inhabitants even use electricity as a means of killing swallows. The capture of quails is very much practised in the south of Sicily, in the neighbourhood of Naples and on the island of Capri, whence more than 50,000 quails have been sent in the course of a year.

This information has been given to show how the passion for killing birds is rooted deeply among certain nationalities, and how it is closely connected with the most important of all material interests, *i.e.*, the question of food. It has penetrated deeply into the lives of the people, and it will be most difficult to eradicate.

The Hungarian Government, faithful to its promises made at the second Ornithological Congress, vigorously continued its efforts in favour of the protection of birds, and on several occasions proposals for some international understanding were made to the Austro-Hungarian Minister of Foreign Affairs who, in turn, repeatedly approached the Governments of the Great Powers. The result was successful, and in March, 1893, the French Government sent to all European countries an invitation to a conference to be held in Paris in order to deal with the subject.

Seventeen states sent delegates to the conference, which, however, did not meet until March, 1895, when it was found very difficult to come to an agreement. The official Italian delegate, M. Henri Gigioli Hilleyer, very courteously accepted the modified declaration of 1875, and a scheme, embodied in fifteen articles, was adopted. The most important decision was that a list of birds useful and destructive to agriculture should be prepared as a supplement to the convention. All the delegates of the countries represented, including Germany, England, Russia, etc., gave their approval, and the convention was submitted for ratification to the various governments concerned.

Judge the surprise when on the 2nd September of the same year, it was announced that Italy declined to adhere to the convention. The Federal Council of Switzerland also raised difficulties and requested that important modifications should be made. Negotiations continued until the Paris Exhibition of 1909, when the Third Ornithological Congress finally came to an agreement as regards the question of birds which are useful and those which are destructive. It was decided to refer to naturalists the task of investigating the food habits of different birds and, from the results obtained, to prepare a list of the birds which should be protected, provided always that the special interests of each country were taken into consideration.

Repeatedly urged again in the Hungarian Government, the Austro-Hungarian Ministers for Foreign Affairs undertook to invite the seventeen governments, whose delegates had accepted the scheme drafted at Paris in 1895, to adopt it as it had subsequently been altered by the French and Hungarian Governments.

These continued efforts finally produced results, and, on the 19th March, 1902, the representatives of twelve countries signed at Paris the "Convention for the Protection of Birds useful to Agriculture." Its provisions, *inter alia*, bound the signatory powers to have the convention ratified by their respective legislatures.

The convention ensures liberty of action to each state as regards the classification of birds, *i.e.*, whether useful or injurious to agricultural interests (par's. 8 and 9), and provision is made for the subsequent adherents of non-signatory states (par. 13).

The convention was signed at Paris in 1892 by the following countries : Germany, Austria, Belgium, Spain, France, Greece, Hungary, Luxemburg, Monaco, Portugal, Sweden and Norway, Switzerland.

Great Britain, Holland, Italy and Russia were among the countries which approved the international agreement of 1895, but they did not sign the final convention.

The convention was ratified in 1906 by the legislatures of all the signatory states.

The fact that, in spite of laborious and earnest work during twenty-four years, only twelve nations subscribed to the Paris Convention of 1902, and that we agriculturists observe from year to year the continued disappearance of birds which are really indispensable to the prosperity of the garden, the field and the forest—the enemies of agriculture meanwhile increasing very rapidly—these facts suggest that our International Institute should, in the general interests of agriculture, deal with the problem of the protection of useful birds.

There could not have been a more opportune moment, because in the countries which did not sign the convention there has been a change of opinion since 1902. In England, for instance, it has been found that the destruction of birds for millinery purposes and for food, has caused a notable decrease in the number of the useful ones (especially those which are insectivorous), and that the ravages of insects have increased considerably. In a work dealing with the disappearance of certain species, Mr. Walter Rothschild has shown the danger of the cruel slaughter which fashion demands. The publication has made quite an impression in England, and voices have been raised in influential quarters in favour of the protection of birds.

The object of this brief analysis of the large amount of material existing on the subject was to throw a little light on the experience of the past 41 years, *i.e.*, since 1868, when the Twenty-sixth Assembly of German Farmers and Foresters inaugurated the movement which still continues, and which represents a vast amount of labour, of patience and of courage on the part of those who have taken part in it without losing heart.

We have been able to indicate the work which has been done and the great effort employed to produce a result which is comparatively small. We are at the same time convinced that the matter can only be successfully arranged if all civilized countries recognize, without delay, the absolute necessity of an international understanding as regards the protection of birds.

Since forty-five different nations have now recognized the absolute necessity of establishing this Institute, we do not believe that you will hesitate, in the universal interests of agriculture and for the honour of humanity, to support the work already undertaken for the effective protection of birds—our best, our most natural and most faithful helpmates which could never be replaced in our daily struggle in the fields.

Here, on this classic soil, which has been for thousands of years the cradle and the home of culture and of the intellectual development of the human race ; where Virgil said so well, "*Dulce est agricultura*," and where he exhorted his countrymen to love agriculture because it is the most noble of occupations ; where Horace extolled the labours of his ancestors and wrote his Ode which begins, "*Beatus ille qui procul negotiis*" ; where Agricola and Cincinnatus rose to the highest dignities of the state ; and, finally, where the generosity of a noble king and thinker has now created for us an institute which is of world-wide importance ; here, indeed, should be heard, in loud tones, the warning of the past. Let us rescue what can still be saved, and with the help of the birds support the struggling farmer. From this great city, with its noble traditions and fertile thoughts may noble sentiments arise and spread throughout the whole world, producing means which shall ensure protection to the birds which Providence has given to us, by staying the hand of the human destroyer.

In the name of culture and of progress which unite nations together in holy alliance, and, inspired by the highest feelings of humanity, we beg the adoption of the following proposal :

(1) In the universal interests of agriculture, the Permanent Committee recognizes the absolute necessity of drawing the attention of the General Assembly to the necessity of organizing means for the efficacious protection of birds useful to agriculture.

(2) Considering that Articles 9 and 12 of the International Convention for the Protection of Birds useful to Agriculture give complete liberty of action to each state, the Permanent Committee desires to express to the General Assembly the wish that the Convention signed at Paris in 1902 be adopted by all the states which have not yet signed it.

(3) The Permanent Committee begs to call the attention of the General Assembly to the utility and necessity—

- (a) of bringing the convention of 1902 to the notice of the states adhering to the Institute, and of inviting those which have not already done so, to signify their adherence, basing this action on the decisions of the General Assembly of the Institute made in December, 1909 ;
- (b) of making, with due despatch, every useful representation to the various governments tending to the complete success and fulfilment of the Convention ;
- (c) of presenting to the next General Assembly a detailed account of the result of these representations.

II. Wheat Shipments from Pacific Ports of North-western United States

BY

F. C. NUNNICK

THE opening of the Panama canal will change many of the currents of the world's commerce. The coasts of North America will be brought closer together ; far-away nations will be brought thousands of miles nearer to us and to each other ; and from a transportation standpoint, a large amount of trade will be altered. Indeed, we cannot predict its ultimate commercial effect with respect to this country and the world generally.

Now that this work is practically completed, people are beginning to inquire as to how the business or industry in which they are respectively engaged will be affected. As it has been asserted that the canal will make it possible to ship a large portion of the wheat grown in Alberta and Southern Saskatchewan *via* Pacific ports, it seemed fitting that an investigation should be made into the conditions and system under which wheat is shipped at present from these points.

The export of wheat from Puget sound is falling off while Portland shipping is showing great gains. In September, 1912, the gross tonnage of the vessels *en route* or listed to load at Portland amounted to 81,682 tons. On the corresponding date in 1911 the total was 58,935 tons and in 1910 it was 53,846 tons. As regards Puget sound, the tonnage on August 28, 1912, was 14,074. In 1911 it was 27,833 tons and in 1910 the total was 19,231 tons. In the cereal year of 1908-09 the export of wheat from Portland was 6,344,626 bushels, while from the ports on Puget sound it was 3,874,630. In 1910-11 from Portland it was 6,626,022 bushels and from Puget sound ports 2,447,780 bushels.

The following table shows the number of wheat-carrying steamers and sailing vessels which left Portland during 1907-08 to 1910-11, and the number of bushels carried :

Cereal Year	Steamers	Bus. Wheat carried	Sailing Vessels	Bus. Wheat carried	Wheat Shipments total
1907-08	18	3,758,750	80	8,168,629	11,927,379
1908-09	14	2,702,546	36	3,551,145	6,253,691
1909-10	9	1,943,889	35	3,657,233	5,601,122
1910-11	9	1,927,191	41	4,698,831	6,626,022
1911-12	13 ¹	1,761,427	44	5,059,836	6,821,263
1912-13	24 ²	3,821,263	31	3,223,874	7,034,727

Wheat shipments from Puget Sound ports are given below :

1911-12	22 ³	2,282,719	7	878,465	3,161,184
1912-13	56 ⁴	4,730,823	4	523,452	5,254,275

¹Five steamers carried part cargoes only ; of these, two carried 109,043 bus. to Mexico and the remaining three carried 86,665 bus. to Japan.

²In addition to these, four steam vessels and seven sailing vessels carried 953,200 bus. and 811,391 bus. of barley respectively to Europe.

³Of the 22 vessels, 14 carried as part cargoes 656,029 bus. to Japan. In addition, 343,945 bus. were carried in steamers as part cargoes to Mexico and South America.

⁴Of the 56 vessels, 48 carried as part cargoes 2,908,865 bus. to Japan. In addition, 204,715 bus. were carried in steamers as part cargoes to South America.

Wheat shipped from Portland and Puget sound is practically all in sacks. The whole process of handling is built up on the sacking system. A large portion of the wheat grown in Idaho, Washington and Oregon is headed, threshed and sacked at one operation. In this way the system begins with sacking. The farmers have equipment for hauling sacked grain to the warehouses situated along the railroads or rivers, which are constructed to store sacked grain. There are practically no elevators for handling wheat in bulk, either throughout these states or in Portland. The vessels calling at Portland are fitted to handle sacked grain only. There is a good demand for sacked grain ; the Japanese in particular demanding it. While custom has had something to do with keeping the sack system in

operation, there are many reasons why the bulk system has not been adopted. There is a great danger of loose wheat shifting and causing vessels to capsize when the rough seas around cape Horn are encountered. Last year, a cargo of barley was lost in rough water only 200 miles from Portland. A strong argument in favour of handling the grain in sacks is the position taken by the marine underwriters, who charge higher rates on bulk cargoes and who, owing to the danger of the cargoes shifting, thus discourage bulk shipments by either sailing vessels or steamers. Wheat in bulk, which has to go through the tropics twice, sweats and moulds, while the sacked cargoes arrive at their destination in good condition. Thus far, the difficulties encountered in trying to make bulk shipments have discouraged the undertaking.

There are, too, some advantages to the farmer and to the rail and river transportation lines in handling wheat on the sacked basis. Costly granaries are not needed by the farmers. If the grain cannot be hauled away from the field immediately it can be piled up and covered until it can be drawn to the warehouse or cars. Sacked grain is shipped in box cars, stock cars, coal cars and even on flat cars, which are furnished with waterproof covers and otherwise temporarily fitted for the purpose. Thus, is avoided the congestion so often encountered when shipping in bulk, and, also the necessity for providing box cars in good condition. Then, too, the identity of each man's crop is retained after it leaves his fields, which is not possible if the grain is all mixed together in an elevator.

The price of sacks has been, and is, an important consideration. The average selling price to farmers of grain sacks during the years 1907-1912 was as follows :

1907.....	9½	cents per sack
1908.....	7½	“ “
1909.....	6½	“ “
1910.....	6½	“ “
1911.....	8	“ “
1912.....	10½	“ “

The farmer buys his sacks for sacking the grain in the field, usually from importers at tidewater or from brokers. No direct allowance per sack is made by the European millers or buyers for the sacks in which the grain is contained, for the reason that it is always bought on a sacked basis and, were they to buy in bulk, the price would undoubtedly be lower than they now pay for the sacked grain.

The sacks are used by the mills in Europe for bran, and are also sold for sacking potatoes and other vegetables. Some years ago

they were sent back to the American shippers and branded "Liverpool Returns," but usually they came back in such poor condition that it was found more satisfactory and more profitable to dispose of them in Europe.

Whether or not the sacking system will be changed when the Panama canal opens is a difficult question to answer. There will undoubtedly be trials made of bulk shipments when the canal is opened and steamers having suitable bulk compartments are available, but even then it is doubtful if the present method of handling grain in sacks will be changed. If the capacity of the mills in Portland and other coast cities is increased to any degree, the milling companies look for the present method to continue, as they prefer to buy the sacked wheat. To make the changes essential for bulk handling will necessitate the expenditure of much money in erecting elevators throughout the country ; in erecting larger elevators at the terminals ; in making the changes necessary in the farmers' equipment ; and, besides these changes, steamers of a different construction would be required to handle the bulk wheat.

This question has been considered from time to time by shipping interests in the East, but each time when they have sent their representatives West to look over the ground, they have concluded that the change would be too expensive for them to make.

The results of the investigation indicate quite clearly that grain exported from the Pacific ports will have to be sacked, and that if grain from Alberta and southern Saskatchewan is to go by the Panama canal, it will be necessary to change from the bulk to the sacking system.

Since this article was written the Federal Government has announced its intention of building a terminal elevator at Vancouver, which will have a capacity of one million bushels. In reply to a letter asking for the probable effect that this would have on the shipping of Canadian grain in sacks, Mr. C. Birkett, Secretary of the Board of Grain Commissioners for Canada, stated in a letter written on June 27th, 1914 :

"I beg to acknowledge receipt of your letter of June 25th asking for information *re* shipments of grain *via* the Pacific coast.

"At present Canadian grain shipped *via* the Pacific coast is sacked in a small elevator at Vancouver, owned and operated by the Canadian Pacific railway. The elevator is located on Burrard inlet and is in fact nothing more than a small sacking plant. No Canadian grain is shipped in bulk from Vancouver at present.

"The market for Canadian grain *via* the Pacific coast is at present a very restricted one. It is either a coastwise trade or consists of small shipments to the Orient.

"It is hoped, and by many expected, that the opening of the Panama canal will lead to the shipment of Canadian grain in bulk to the United Kingdom, especially from Alberta and western Saskatchewan. It is also hoped by some that with the increase of flour consumption in Japan and China there will develop a considerable export of Canadian grain to those countries.

"The Board of Grain Commissioners recommended the Government to erect a transfer elevator on Burrard inlet, Vancouver, with a capacity of one million bushels, or slightly over, for the purpose of testing the Panama route and facilitating these expectations. The elevator will be operated by the Board of Grain Commissioners and will be equipped, amongst other things, with a sacking apparatus. It is hoped, however, that in time grain will be shipped in bulk and the elevator will be designed with that in view.

"A terminal elevator is being built by the Government for the Board of Grain Commissioners at Calgary with $2\frac{1}{2}$ million bushels storage capacity. The inspection of the grain shipped *via* the Pacific coast will be done at Calgary. There is a question, which only experience can solve, about the effect of the moisture upon grain shipped in bulk *via* the Panama canal. The Board of Grain Commissioners believe that grain shipped *via* the Pacific coast should be thoroughly tested for moisture at Calgary and if necessary dried there. As there is no closed season for navigation at Vancouver, it is less necessary to store the grain at the port. The contract for the elevator at Calgary has already been let. The designs for the elevator at Vancouver are being prepared by the engineering staff of the Board and it is hoped they will be completed within three months.

"You understand, of course, that the question of whether the grain is shipped in bulk or in sack is not within the province of the Government to decide—it is a trade question. In the Pacific states of the United States, sack shipment has been the rule up to the present. Grain growers of the Pacific Coast states are, however, very much opposed to the sack shipment and are building elevators. Grain dealers on the Pacific coast have been rather opposed to bulk shipment, but some elevators have been and are being built at the ports and some of the vessels trading to Seattle have been made fit for the bulk carrying of grain.

"There is little doubt that if grain is shipped in any considerable quantity from Canadian ports on the Pacific coast it will within a short time be shipped in bulk and not in sacks."

III. Canadian Town-planning and Housing Laws

Quebec

AN ACT TO ASSIST IN THE CONSTRUCTION OF DWELLING-HOUSES IN CITIES, TOWNS AND VILLAGES

HIS MAJESTY, with the advice and consent of the Legislative Council and of the Legislative Assembly of the Province of Quebec, enacts as follows :

1. In this act, unless the context requires a different interpretation,

a. The word "company" means a company incorporated by charter of this Legislature, or by letters patent of this province, for the objects indicated in section 2 ;

b. The words "assisted company" mean a company as defined by paragraph *a* of this section, whose loan has been guaranteed by a municipality under the provisions of this act.

c. The words "council" or "municipality" mean a city, town or village municipality situated in this province, and the body which, according to the laws in force in such municipality, has the right to make enactments or to administer for and in the name of the municipality.

When in any municipality there is a Board of Commissioners with administrative or executive powers, the council may avail themselves of all or any of the provisions of this act only with the consent, given in advance, of such Board ;

d. The word "obligations" includes all bonds, debentures, inscribed stock or other securities.

e. The word "books" includes all documents in the possession of the assisted company.

2. A company incorporated with the object of acquiring lands in or near the boundaries of a municipality in the province, and to build on such land dwelling-houses of reasonable dimensions, supplied with proper improvements, and intended to be let at a moderate price, may take advantage of the provisions of this act, by conforming to the conditions imposed thereby.

3. The council of any municipality may, to the extent and in the manner hereinafter declared, guarantee as to principal and interest, loans sought to be made by a company, provided that it be shown :

a. That additional dwelling-houses are required to properly house the people who live or work within its boundaries ;

b. That the object of the company is in good faith to furnish comfortable dwellings, and not to make a profit greater than that allowed by this act.

c. That the company, without making loans other than those of which a guarantee is sought, will be in a position to carry out the programme described in section 2, and in paragraph b of this section.

4. The by-law or the resolution respecting the guarantee of any loan shall, before having any force or effect, be approved by the majority in number and in value of such municipal electors, who are proprietors, as may vote on such by-law or resolution.

5. Such by-law or resolution shall not be submitted for the approval of such municipal electors until the complete plans and the lands of the assisted company have first been approved by the municipal council, and by the Board of Health of the Province of Quebec.

6. Such by-law or resolution shall be submitted to such electors for approval within six months after having been passed by the council ; otherwise it shall become null and of no effect.

Nevertheless, in the cities of Quebec and Montreal it shall be sufficient if such by-law or resolution be approved by the vote of two-thirds of the members of the council, and, if there be one, by the Board of Commissioners, without requiring direct approval by the municipal electors who are property-owners.

7. The proceedings of the meeting of municipal electors and the vote on the question of approval of the by-law or resolution, shall be those, *mutatis mutandis*, prescribed by the charter of the municipality, by the general law applying thereto, or by both, for the approval of by-laws by municipal electors who are proprietors.

8. The guarantee authorized by this act may be given by a municipality only in case the rights of such municipality are protected by one or more deeds of hypothec or deeds of trust by way of first mortgage upon the whole or part of the lands in question, with the houses and improvements built and made or to be built and made thereon.

Such deeds of hypothec or trust, once registered, shall constitute a valid guarantee in favour of the municipality notwithstanding any general law to the contrary.

9. The manner of making the loan, the nature of the document which evidences it, the form and the terms of the deeds of hypothec or of trust, the manner of repayment of the loan, the choice of trustee

or trustees, if any there be, the form and manner of the guarantee, the time for the issue of securities, and the disposition of the moneys to be raised thereon by the assisted company which shall issue the same, the privileges which may be granted to tenants purchasing shares in the company, the manner of re-imbursing them for such shares, if they move away, and all other details necessary for the putting in operation of this act, shall be according to the decision of the municipality.

10. If by reason of the guarantee authorized by this act, any municipality shall become liable for certain sums of money, it may provide for the payment of the same out of the general funds of the municipality not otherwise disposed of, or by a special issue of debentures payable within a term not exceeding 40 years from the date of issue thereof. Such special loan shall not be subject to the approval of the municipal electors or of the Lieutenant-Governor, alone or in council, notwithstanding the provisions of any public or private act to the contrary.

11. The total amount of loan which may be guaranteed by a municipality, under this act, shall not exceed eighty-five per cent of an amount to be fixed in the deed of hypothec or of trust as representing the value of the lands and houses and other improvements to be built and made thereon.

12. The said deed or deeds of hypothec or of trust may make any provision deemed suitable by the municipality and the assisted company, as regards either the manner of applying the funds of such company, the purchase of additional lands, the construction of houses and their accessories, or generally any other provisions in accordance with section 9 of this act, which may be deemed useful to insure the proper putting into operation of this act.

13. The council of any municipality which shall avail itself of this act, may, from time to time, by resolution, appoint some person to represent such municipality on the directorate of the company; and the director so appointed, until such time as his appointment be revoked by such council, shall have the same powers as any other director.

It shall not be necessary for the director so appointed by the council to possess the qualifications usually required of a director, and his appointment shall be valid whatever may be the number of directors fixed by the charter or the by-laws of such assisted company.

14. The books of the assisted company shall, every day, during ordinary office hours, be open to inspection by any person appointed by the council of the municipality in question to examine such books in order to ascertain whether the provisions of this act have been obeyed.

15. No dividend upon the capital stock of the assisted company or other distribution of profits among the shareholders shall be declared or made in excess of six per cent per annum upon the amounts paid in.

If the dividend or profits paid or distributed in any one year do not amount to six per cent, the assisted company may make up the difference, with interest, so soon as the net profits of such company allow, in any subsequent year or years.

16. The net profits realized by such assisted company in any one year after deducting such sums as it must set aside to meet its debts and obligations, must be utilized, first for the payment of the dividends permitted by this act, and then for the creation of a reserve fund of a reasonable amount to provide for unforeseen expenses. Any amount remaining must then be applied, as soon as possible, to the acquisition of new lands, the construction of new buildings, and all sorts of improvements within the powers of the company, or to the redemption of shares in the capital stock of the company in the manner hereinafter set forth.

17. The assisted company may, with the approval of the council of the municipality which has guaranteed its loan, expressed by way of resolution, pass a by-law authorizing the redemption, either wholly or in part, of the outstanding shares of its capital stock, on such terms and conditions as it may deem reasonable.

For the purposes of such redemption the assisted company may make use of all the funds at its disposal in the treasury, even including that which represents the amount paid in as the price of such shares.

No assisted company so redeeming the outstanding shares of its capital stock, may pay for the same any premium exceeding ten per cent of the actual amount paid in for such shares.

18. The assisted company shall be obliged to redeem the outstanding shares of its capital stock as provided in section 17, when, after the expiration of five years following the date at which the first guarantee was given, a positive demand to that effect is made, in the form of a resolution of the council of the municipality which has guaranteed its loan.

Any difficulty between the assisted company and the municipality respecting such redemption shall be submitted to the decision of a single arbitrator to be chosen by the parties.

If the parties cannot agree on an arbitrator, each party shall name a special arbitrator, and the two thus chosen shall choose a third.

If the two arbitrators cannot agree on a third arbitrator, the latter shall be appointed at the request of the parties by the judge in chambers of the Superior Court of the district.

The decision of the arbitrator or of a majority of the arbitrators, as the case may be, shall be final.

The failure of the assisted company to submit to the decision of the arbitrator or arbitrators, as the case may be, shall be a ground for a request for the dissolution of such company or for the annulment of the letters patent which incorporated the same.

19. The proceedings in dissolution or in annulment of letters patent shall be governed, *mutatis mutandis*, by articles 978 and the following, or 1007 and following, as the case may be, of the Code of Civil Procedure.

The curator appointed to the property of the company according to the ordinary rules applicable to dissolved corporations, shall pay, out of the assets, the debts of the company, and shall provide for the redemption of the shares, under the direction of the judge, and shall transfer the balance of the assets to the board of trustees hereinafter established.

20. The assisted company may, with the approval of the council of the municipality which has guaranteed its loan, expressed by way of resolution, establish, by notarial deed *en minute* and with the view of promoting the objects of this act, a board of trustees, whose functions shall be to hold, on the terms and conditions set forth in the deed creating such trust, the redeemed shares, whether the same be given to the company or to the board.

21. The deed creating such trust must indicate the powers conferred on the board of trustees, provide for the appointment of successors to the first trustees, and reserve to the assisted company, subject to the approval of the municipal council, the right of modifying the terms and conditions on which such board of trustees has been established.

The revenue of all property held in trust shall be employed only in the manner set forth in the deed creating the trust.

22. The assisted company shall be obliged to proceed to the establishment of the board of trustees above mentioned when, after the expiration of five years following the date at which the first guarantee was given, a positive demand to that effect is made, in the form of a resolution of the council of the municipality which has guaranteed its loan.

Any difficulty which may arise respecting the terms and conditions to be contained in the deed creating the board of trustees shall be submitted to the decision of an arbitrator or arbitrators, as provided in section 18.

23. The board of trustees, when all the shares of such assisted company have been transferred to it, shall constitute a corporation with perpetual succession, and may have a common seal which it may alter at its pleasure. It shall also possess in the name given to it by the deed creating the trust, and under the restrictions and conditions therein set out, all the powers ordinarily possessed by corporations under the laws in force, including the capacity to acquire by purchase or donation, with the object of promoting the ends for which it was established.

However, the board may not alienate nor hypothecate any immoveables that it may hold, unless it is so authorized by the deed creating the trust.

24. The board of trustees, when constituted a corporation, shall submit to the Lieutenant-Governor in Council, when required by the provincial secretary, a list of its members, a detailed statement of the immoveable property it holds in trust, and a summary of its total revenue.

25. The council of any municipality which has guaranteed the loan of an assisted company shall be entitled to the recourse given by articles 992 and following of the Code of Civil Procedure, to compel the company, its directors and officers, or the board of trustees, when it is constituted a corporation, and its officers, to put in operation any one of the provisions of this act, or of the directions issued thereunder.

26. In case of the liquidation of the assisted company, the municipality may appoint the board of trustees, but, to be valid, such appointment must be approved by the Lieutenant-Governor in Council.

27. The council of the municipality which has guaranteed the loan, may, by by-law which need not be submitted to the electors

for approval, appropriate, out of the general funds of the municipality not specially devoted to other purposes, such amount as it may deem necessary to redeem the shares of the assisted company.

28. Such shares, whether redeemed by the assisted company or given to it by a shareholder, shall not be deemed to be cancelled. They shall be held by the board of trustees for the purposes set forth in the deed creating the trust.

29. No shares of the capital stock of the assisted company shall be issued for any other consideration than for cash paid into the treasury of said company, and payments made by shareholders, or amounts received as gifts, shall not be used for expenditures other than those connected with the carrying out of the main purposes of the company, as set forth in section 2.

30. This act shall come into force on the day of its sanction.

Ontario

AN ACT TO ENCOURAGE HOUSING ACCOMMODATION IN CITIES AND TOWNS

3-4 Geo. V., Chap. 57. Assented to 6th May, 1913

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows :

1. In this Act,

“Lands” shall include leaseholds ;

“Securities” shall mean bonds, debentures, debenture stock, or other securities.

2. A Company, incorporated under *The Ontario Companies Act*, with a share capital whose main purposes of incorporation are the acquisition of lands in or near a city or town in Ontario and the building and making thereon of dwelling houses of moderate size and improvements and conveniences, to be rented at moderate rents, may petition the council of such city or town to guarantee its securities, to enable or assist it to raise money to carry out such main purposes.

3. (1) If the council is satisfied that additional housing accommodation for those living or working in the municipality is urgently needed, and that the main purpose of the company is to help, *bona fide*, in supplying such need, and is not to make profits, and that the company, without borrowing the money required, over and above the proceeds of the guaranteed securities, for the housing accommodation in contemplation, will be able to provide the same, the council may, with the assent of the electors entitled to vote on money by-laws, pass a by-law authorizing and providing for the giving by the council of such guarantee to the amount and upon the terms and conditions hereinafter contained.

(2) It shall not be necessary to obtain the assent of the electors to the by-law if it is approved of by the Provincial Board of Health.

4. The council, or a committee thereof, shall, before the guarantee is given, approve of the location of the lands selected for the housing accommodation and of the general plans for the houses.

5. The securities to be guaranteed shall be secured by one or more deeds of trust by way of first mortgage or charge upon such lands as the council or committee may approve of, including the houses and improvements built and made or to be built and made thereon.

6. The kind of securities to be guaranteed and the forms and terms thereof, and the forms and terms of the deed or deeds of trust securing them, and the trustee or trustees, and the times and manner of the issue of securities, and the disposition of the moneys to be raised thereon by sale, pledge or otherwise, pending the expenditure of such moneys, and the forms and manner of guarantee, shall be such as the council or committee approve of ; and such terms, provisions and conditions may be included in such deed or deeds of trust as the council or committee deem expedient or necessary.

7. (1) The guarantee shall be signed by the mayor and treasurer of the municipal corporation, and upon being so signed the corporation shall become liable for the payment of the principal and interest of the securities guaranteed, according to the tenor thereof.

(2) If the corporation becomes liable to pay any of such guaranteed securities, it may provide for the payment of the same out of the general funds of the corporation or by the issue of debentures payable within a term not exceeding ten years from the issue thereof, and it shall not be necessary to obtain the assent of the electors to a by-law providing for the issue of such debentures.

8. The total amount of securities to be guaranteed shall not in the first instance exceed 85 per cent of an amount to be fixed in the deed or deeds of trust as representing the value of the lands and housing accommodation and improvements to be built and made thereon, and the said deed or deeds may make all convenient provisions for the expenditure of additional moneys on the said lands and housing accommodation and improvements and for the acquisition of additional lands to be made part of the mortgaged premises and for expenditure thereon, and for the issue of additional guaranteed securities under said deed or deeds, but so that the total amount outstanding shall not exceed 85 per cent of the value of the mortgaged premises to be ascertained and fixed in the manner provided in such deed or deeds, and for the issue of such additional securities in advance of expenditure, and for the disposition of the moneys to be raised thereon by sale, pledge or otherwise, pending the expenditure thereof.

9. The council of the municipal corporation which guarantees securities of the company as provided for in this Act may from time to time appoint and remove one member of the Board of Directors of such company, and in case of a vacancy in such membership by removal, death, resignation or otherwise, his successor may be appointed by the council, and so on from time to time. It shall not be necessary for the appointee of the council to hold stock in the capital of the company or to be otherwise qualified as a director.

10. The books of a company whose securities have been guaranteed by a municipal corporation (hereinafter referred to as the "Assisted Company") shall at all times be open to inspection by any person named in that behalf by the council.

11. (1) No dividend upon the capital stock of the Assisted Company or other distribution of profits among the shareholders shall be declared or paid exceeding six per cent per annum in any one year.

(2) Such dividend may be payable in instalments during the year.

(3) If the sums paid in any year do not amount to six per cent, the deficiency, with interest, may be made up in any subsequent year or years.

12. (1) Any net profits received by the Assisted Company in any year, and not required to pay said six per cent or to make up a deficiency therein or for a reasonable contingent fund, shall be

expended by the company in acquiring lands, improving its housing accommodation by way of new buildings, additions, extensions or other improvements, or in redeeming or getting in the capital stock of the company, as hereinafter provided.

(2) The High Court Division of the Supreme Court of Ontario shall have jurisdiction, upon the application of the council of the municipal corporations guaranteeing the company's securities, to enforce by mandamus or otherwise the carrying out of this section by the company, its directors and officers.

13. (1) The assisted Company may, with the approval of the council of the municipal corporation guaranteeing its securities, pass a by-law providing for redeeming or getting in, upon such plan and terms and at such times as may be deemed best, the whole or part from time to time of the outstanding shares in the capital stock of the company.

(2) For such purpose any available moneys, whether representing capital or otherwise, may be used. Provided always that no greater premium than ten per cent shall be paid upon the redemption or getting in of any share. Provided that after five years from the first issue of guaranteed securities the company, at the request of the said council, shall pass such by-law and any difference which may then arise respecting the terms thereof shall be settled by the Lieutenant-Governor in Council.

14. Any shareholder may give or bequeath to the Assisted Company or to the Board of Trustees established under section 14, the whole or any part of his shares in the capital stock of the company, and the company may accept and hold the same until transferred to the said Board of Trustees.

15. The Assisted Company may, with the approval of the council of the municipal corporation guaranteeing the securities, establish a Board of Trustees to receive and hold the shares redeemed or got in or given or bequeathed to the company or to such board, upon such trusts and for such purposes and with such powers as may be thought expedient in furtherance of the objects of this Act and as may be declared or provided for in the instrument establishing the board. The successors of the said trustees shall be appointed in the manner provided for in said instrument. The company with the like approval may alter the terms of said instrument and add to or otherwise vary the trusts, purposes and powers therein mentioned. Provided that after five years from the first issue of guaranteed securities the

company, at the request of the said council, shall establish such Board of Trustees. Any differences which may then arise respecting the terms of the instrument establishing the board shall be settled by the Lieutenant-Governor in Council.

16. The shares redeemed or got in or given or bequeathed to the company shall not become extinct but shall be transferred to and vested in the said Board of Trustees.

17. The council of the municipal corporation guaranteeing the company's securities may from time to time furnish the company with moneys to be applied in the redemption or getting in of shares from time to time under the terms of the by-laws above mentioned and the company shall apply such moneys accordingly.

18. No stock in the capital of the Assisted Company shall be sold or disposed of for any consideration other than cash, and moneys received by the Assisted Company on account of its capital stock shall not be used for expenditures other than those connected with the carrying out of the main purposes of the company, viz., the acquisition of lands in or near a city or town in Ontario and the building and making thereon of dwelling houses of moderate size and improvements and conveniences, and the carrying out of the objects of this act.

19. The Assisted Company may accept legacies, gifts and devises of personal and real property notwithstanding *The Mortmain and Charitable Uses Act*.

Alberta

AN ACT RELATING TO TOWN-PLANNING

Stats. of Alberta, Chap. 18, Assented to March 25, 1913

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Alberta, enacts as follows :

1. A town-planning scheme may be prepared in accordance with the provisions of this Act with respect to any land which is in course of development or appears likely to be used for building purposes, with the general object of securing suitable provision for traffic, proper sanitary conditions, amenity and convenience in connection with the laying out of streets and use of the land and of any neighbouring lands for building or other purposes.

(2) The term "Local Authority" as hereinafter used in this Act, shall mean any city or town council of any regularly incorporated city or town or the municipal council of any municipality in the Province of Alberta, and the term "Minister" as hereinafter used in this Act shall mean the Minister of Municipal Affairs of the Province of Alberta.

(3) Any local authority may make application to the Minister for authority to put into effect a town-planning scheme or any part thereof and the Minister may authorize a local authority to prepare and put into effect a town-planning scheme or any part thereof with reference to any land within or in the neighbourhood of the area over which it has municipal control, if the local authority satisfies the Minister that there is a *prima facie* case for making such a scheme, or the Minister may authorize a local authority to adopt with or without modifications any such scheme or any part thereof, proposed by all or any owners of land, with respect to which the local authority might itself have been authorized to prepare a town-planning scheme.

(4) The expression "land likely to be used for building purposes" shall include any land likely to be used as or for the purpose of providing open spaces, roads, streets, parks, pleasure or recreation grounds, or for the purpose of executing any work upon or under the land incidental to a town-planning scheme, whether in the nature of a building work or not, and the decision of the Minister as to whether land is likely to be used for building purposes shall be final.

(5) The Minister may authorize the inclusion in a town-planning scheme of any land already built upon or any land not likely to be used for building purposes, if it be made to appear to him that such land is so situated that it ought to be included, and may provide for the demolition or alteration of any building thereon so far as may be necessary for carrying the scheme into effect.

(6) A town-planning scheme prepared or adopted by a local authority shall not have effect unless approved by written order of the Minister, and the Minister may refuse to approve any such scheme except with such modifications and subject to such conditions as he may think fit to impose; provided that before a town-planning scheme can be approved of by the Minister notice of intention to make application for its approval must have been published in The Alberta Gazette of the province for at least one month, and if within twenty-one days from the publication of such notice, any interested person or authority files notice of objection in the pre-

scribed manner, such objection shall be heard and adjudicated upon by the Minister or by such board or boards of commission as may be appointed by the Minister for the purposes of hearing and adjudicating upon all or any matters of dispute, which may arise between a local authority or a responsible authority, and other interested parties.

In the event of objections being sustained by the Minister or such Board of Commission as he may appoint for the purpose of adjudicating upon them, no proceedings shall be taken toward carrying part of the scheme so objected to into effect, but this without prejudice to the preparation of a new or modified scheme covering the same area or any part thereof.

(7) A town-planning scheme may be varied or revoked by a subsequent scheme prepared or adopted by a local authority or a responsible authority, and approved by the Minister in accordance with the provisions of this Act.

(8) A town-planning scheme when approved by the Minister shall have effect as if it were specially enacted in this Act.

2. The authority to be responsible for the carrying out of a town-planning scheme, herein referred to as the "Responsible Authority" may be either :

- (a) The local authority applying for approval of the scheme ;
- (b) Where land included in a town-planning scheme is in the area of more than one local authority or in the area of a local authority by whom the scheme was not prepared, the responsible authority may be one of those authorities, or for certain purposes of the scheme it may be one local authority and for certain purposes another local authority ; or
- (c) A body constituted specially for the purpose of the scheme as hereinafter provided and all necessary provision may be made by the scheme for constituting such body and giving it the necessary powers and duties.

(2) For the purpose of preparing a town-planning scheme and carrying the same into effect, a local authority, or the local authorities, where more than one is interested, may singly or jointly appoint a commission of not less than five, or more than ten members, whose names shall be submitted to the Minister for approval, and upon the approval by the Minister of the scheme, and of the constitution of the commission named therein, the commission thus appointed shall become the responsible authority for carrying the scheme into effect, to whom shall be delegated all the powers conferred by, and, for the purposes of this Act, upon the local authority.

Vacancies as they occur may be filled from time to time by the local authority or authorities.

(3) The Lieutenant-Governor in Council may prescribe a set of general provisions (or separate sets of general provisions adapted for areas of any special character) for carrying out of the general objects of town-planning schemes and in particular for dealing with matters set out in the schedule A attached to this Act and the general provisions or separate sets of general provisions appropriate to the area for which the town-planning scheme is made, shall take effect as part of every scheme, except so far as special provision is made by the scheme as approved by the Minister, for the variation or the exclusion of any of these general provisions and shall have the same effect as if specially enacted by the Legislature.

(4) Special provisions shall in addition be inserted in every town-planning scheme defining in such manner as may be prescribed by regulations under this Act, the area to which the scheme is to apply and the authority which is to be responsible for enforcing the observance of the scheme, and for the execution of any works which under the scheme, or under the Act, are to be executed by the responsible authority, and providing for any matters which may be dealt with by general provisions, and otherwise supplementing, excluding or varying the general provisions and also dealing with any special circumstances or contingencies for which adequate provision is not made in the general provisions, and for suspending, so far as necessary for the proper carrying out of the scheme, any enactments, by-laws, regulations or other provisions made by a local authority, which are in operation in the area included in the scheme, and such special provision shall have the same effect as if specially enacted by the Legislature.

(5) Special provision may also be made in every town-planning scheme defining the manner in which the funds necessary for the carrying it into effect are to be procured. If no such provision is made in the scheme, funds may be procured in any way authorized for local improvement or general purposes by any public or private act in force in the city, town or municipality affected by the scheme ; provided always that no assessment upon any city, town or municipality shall be authorized by any town-planning scheme, without the consent of the local authority in control of the area affected being first had and obtained ; nor shall any power to borrow money either by issue of bonds or otherwise, be conferred upon a responsible authority, by any town-planning scheme, except with the approval of the local authority having municipal control of the area affected.

(6) The Minister may certify any by-laws for contracting debts or incurring liabilities, and for this purpose, sections 190 to 193, inclusive, of *The Town Act*, *mutatis mutandis*, are hereby incorporated into and shall be deemed to be part of this Act.

(7) Any expenses incurred in preparing any town-planning scheme may be paid out of current revenue by the local authority or out of the proceeds of any special tax levied for part purposes to an amount not to exceed \$20,000 in the case of cities, \$10,000 in the case of towns and \$5,000 in the case of other municipalities.

3. The Minister may make regulations for regulating generally the procedure to be adopted with respect to applications for authority to prepare or adopt a town-planning scheme, the preparation of the scheme, obtaining the approval of the Minister to a scheme so prepared or adopted, and any inquiries, reports, notices or other matters required in connection with the preparation or adoption or the approval of the scheme, or preliminary thereto, or in relation to the carrying out of the scheme, or enforcing the observance of the provisions thereof.

(2) Provision shall be made by these regulations :

- (a) For securing co-operation on the part of the local authority with the owners and other persons interested in the land proposed to be included in the scheme at every stage of the proceedings by means of conferences and such other means as may be provided by the regulations ;
- (b) For securing that notice of the proposal to prepare or adopt the scheme should be given at the earliest stage possible to any parties interested in the land ; and
- (c) For dealing with the other matters mentioned in schedule B to this Act.

4. The responsible authority may at any time, after giving such notice as may be provided by a town-planning scheme and in accordance with the provisions of this Act :

- (a) Remove, pull down or alter any building or other work in the area included in the scheme which is such as to contravene the scheme or in the erection or carrying out of which any provision of this scheme has not been complied with ;
or
- (b) Execute any work which it is the duty of any person to execute under the scheme in any case where it appears to any authority that delay in execution of the work would prejudice the efficient operation of the scheme.

(2) Any expenses incurred by the responsible authority under this section may be recovered from the persons in default in such manner and subject to such conditions as may be provided by the scheme.

(3) If any question arises whether any building or work contravenes a town-planning scheme, or whether any provision of a town-planning scheme is not complied with in the erection or carrying out of any such building or work, that question shall be referred to the Minister or such board as he may appoint for the purpose, and, unless the parties otherwise agree, shall be determined by the Minister or such board as arbitrators and their decision shall be final and conclusive and binding on all persons.

5. Any person whose property is injuriously affected by the making of a town-planning scheme, shall, if he makes a claim, for the purpose within the time (if any) limited by the scheme (not being less than three months after the date when notice of the approval of the scheme is published in the manner prescribed by regulations made by the Minister) be entitled to obtain compensation in respect thereof from the responsible authority.

(2) A person shall not be entitled to obtain compensation under this section on account of any building erected on or contract made or other thing done with respect to land included in a scheme or after the time at which the application for authority to prepare the scheme has been made, or after such other time as the Minister may fix, for the purpose.

Provided this provision shall not apply as respects any work done before the date of the approval of the scheme for the purpose of finishing a building begun or of carrying out a contract entered into before the application was made.

(3) Where by the making of any town-planning scheme, any property is increased in value, the responsible authority, if they make a claim for the purpose within the time (if any) limited by the scheme (not being less than three months after the date when notice of the approval of the scheme is first published in the manner prescribed by regulations made by the Minister) shall be entitled to recover from any person whose property is so increased in value, one-half of the amount of that increase.

(4) Any question as to whether any property is injuriously affected or increased in value within the meaning of this section, and as to the amount and manner of payment (whether by instalments or otherwise) or the sum which is to be paid as compensation under this section or which the responsible authority is entitled to

recover from a person whose property is increased in value, shall be determined by arbitration under the provisions of *The Arbitration Act*, unless the parties agree on some other method of determination.

(5) Any amount due under this section as compensation to a person aggrieved from the responsible authority, or to a responsible authority from a person whose property is increased in value, may be recovered summarily as a civil debt.

(6) Where a town-planning scheme is revoked by an order of the Minister under this Act, any person who has incurred expenditure for the purpose of complying with the scheme shall be entitled to compensation in accordance with this section in so far as any such expenditure is rendered abortive by reason of the revocation of the scheme.

6. Where property is alleged to be injuriously affected, by reason of any provisions contained in a town-planning scheme, no compensation shall be paid in respect thereof, if or so far as the provisions are such as would have been enforced if they had been contained in by-laws made by the local authority.

(2) Property shall not be deemed to be injuriously affected by reason of the making of any provisions inserted in a town-planning scheme, which with a view to securing the amenity of the area included in the scheme or any part thereof, prescribe the space about buildings or limit the number of buildings to be erected or prescribe the height or character of buildings or the amount of vacant land to be taken for parks or open spaces not to exceed five (5) per cent of the total area and which the Minister having regard to the nature and situation of the land affected by the provisions consider reasonable for the purpose.

(3) Where a person is entitled to compensation under this part of this Act in respect to any matter or thing, and he would be entitled to compensation in respect to the same matter or thing, under any other enactment, he shall not be entitled to compensation in respect of that matter or thing both under this Act and under that other enactment, and shall not be entitled to any greater compensation under this Act than he would be entitled to under the other enactment.

7. The responsible authority may, for the purpose of a town-planning scheme, purchase any land comprised in such scheme by agreement, or compulsorily, in the same manner and subject to the same provisions as a local authority may purchase under any local or public Act.

(2) In the event of compulsory purchase, the arbitrators or arbitrator in deciding the values or compensation shall take into consideration the increased value that will be given to any lands by the scheme, or by reason of the enforcement thereof and shall set off such increased value that will attach to such lands or grounds against the inconveniences.

8. If the Minister is satisfied on any representation, after holding a public enquiry that a local authority :

- (a) Have failed to take the requisite steps for having a satisfactory town-planning scheme prepared and approved in a case where a town-planning scheme ought to be made ;
- (b) Having failed to adopt a scheme proposed by owners of any land in a case where a town-planning scheme ought to be adopted ; or
- (c) Have unreasonably refused to consent to any modification or conditions imposed by the Minister, the Minister may, as the case requires, order the local authority to prepare and submit for his approval, such a town-planning scheme, or to adopt the scheme or to consent to the modifications or conditions so inserted :

Provided that, where the representation is that a local authority have failed to adopt a scheme, the Minister, in lieu of making such an order as aforesaid, may approve the proposed scheme subject to such modifications or conditions, if any, as he thinks fit, and thereupon the scheme shall have effect as if it had been adopted by the local authority and approved by the Minister.

(2) If the Minister is satisfied on any representation after holding an inquiry, that a responsible authority has failed to enforce effectively the observance of a scheme which has been confirmed, or any provisions thereof, or to execute any works, which under the scheme of this Act, the authority is required to execute, the Minister may order that authority to do all things necessary for enforcing the observance of the scheme or any provisions thereof effectively, or for executing any works which under the scheme or this part of this Act the authority is required to execute.

(3) Any order under this section may be enforced by mandamus.

9. Any expenses incurred by the Minister under this Act, including the payment of any Board or Commission, shall be paid out of any funds appropriated from the general revenue fund to the Department of Municipal Affairs for that purpose.

10. This Act may be cited as "*The Town Planning Act.*"

SCHEDULE A

MATTERS TO BE DEALT WITH BY GENERAL PROVISIONS
PRESCRIBED BY THE MINISTER

1. Streets, tramways, roads and other ways, and stopping up or diversion of existing highways.
2. Buildings, structures and erections.
3. Open spaces, private and public.
4. The preservation of objects of historical interest or natural beauty.
5. Sewerage, drainage and sewage disposal.
6. Lighting.
7. Water supply.
8. Ancillary or consequential works.
9. Extinction or variation of private rights-of-way and other easements.
10. Dealing with or disposal of land acquired by the responsible authority or by a local authority.
11. Power of entry and inspection.
12. Power of the responsible authority to remove, alter or demolish any obstructive work.
13. Power of the responsible authority to make agreements with owners, and of owners to make agreements with one another.
14. Power of the responsible authority or a local authority to accept any money or property for the furtherance of the objects of any town-planning scheme, and provision for regulating the administration of any such money or property.
15. Application with necessary modifications and adaptations of statutory enactments.
16. Carrying out and supplementing the provisions of this Act for enforcing schemes.
17. Limitation of time for operation of scheme.
18. Co-operation of the responsible authority with the owners of land included in the scheme or other person interested by means of conference and other means.
19. Charging on the inheritance of any land the value of which is increased by the operation of a town-planning scheme the sum required to be paid in respect to that increase and for that purpose applying with the necessary adaptations, the provisions of any enactments dealing with charges for improvements of land or making special provisions to govern the same.

SCHEDULE B

1. Procedure anterior to and for the purpose of an application for authority to prepare or adopt a scheme.
 - (a) Submission of plans and estimates.
 - (b) Publication of notices.
2. Procedure during, on, and after the preparation or adoption and before the approval of the scheme.
 - (a) Submission to the Minister of the proposed scheme with plans and estimates.
 - (b) Notice of submission of proposed scheme to the Minister.
 - (c) Hearing of objections and representations by persons affected, including persons representing architectural or archæological societies or otherwise interested in the amenity of the proposed scheme.
 - (d) Publication of notice of intention to approve scheme and the lodging of objections thereto.
3. Procedure after the approval of the scheme.
 - (a) Notice to be given of the approval of the scheme.
 - (b) Inquiries and reports as to beginning and the progress and completion of works and other action under the scheme.
4. Duty, at any stage, of the local authority to publish or deposit for inspection any scheme, or proposed scheme, and the plans relating thereto, and to give information to persons affected with reference to any such scheme or proposed scheme.
5. The details to be specified in plans, including wherever the circumstances so require, the restrictions on the number of buildings which may be erected on each acre and the height and character of these buildings.

IV. First Aid to the Injured

BY

CHAS. A. HODGETTS, M.D., D.P.H., ETC.

THERE are no reliable statistics available showing the number or the nature of the accidents which occur in Canada annually. It is, however, safe to assume that they are very numerous and that many of them are preventable. Of those that do occur, in but few instances can those who are near render the necessary first aid, which, if promptly administered, would prevent suffering and often save life. In too many cases, the onlookers are merely sympathetic, quite unable to assist the injured and forced to await the arrival of the doctor. Such helpless ignorance is culpable, as knowledge of first aid can be readily obtained, so that anyone who

will put forth the effort can be, when the need arises, not only a sympathetic bystander, but also a good Samaritan.

The work of first aid has passed the experimental stage in Canada. In each of the provinces the St. John Ambulance Association has established its provincial and local centres, and the Committee on Public Health of the Commission desires to indicate the desirability of having this work still further elaborated. At the present time both the Canadian Pacific and the Grand Trunk railways are contributing to the instruction of their employees in first aid ; the former company expending no less than \$10,000 annually for lectures and the operation of two instruction cars over their system. The work has also been instituted this year on the Intercolonial railway.

Then too, we find that many of the police of our larger cities are certified first aiders, and, at the present time, there are several thousand certified first aiders in civil life in Canada.

Again, it is worthy of note that two provinces have already recognized the necessity for at least some of the employees of all coal mines having certificates in first aid. The province of British Columbia in its Act regulating coal mines provides that* :

"A candidate for a certificate of competency as manager, overman, shift boss, fire boss or shotlighter shall produce a certificate from a duly qualified medical practitioner or St. John or other recognized ambulance society, showing that he has taken a course in ambulance work fitting him, the said candidate, to give first aid to men injured in coal mining operations."

An Act to Consolidate and Amend the Coal Mines Regulation Act, 1911, Alberta—requires† those who are applicants for examination for certificates of either manager, overman or examiner to produce to the board :

"a certificate from a duly qualified medical practitioner or from a recognized ambulance society showing that he has taken a course in ambulance work fitting him to give first aid to persons injured in or about a mine."

The time is opportune for the several provinces to lend their aid financially to this branch of popular education. Some recognition in the way of financial aid to each class of say twenty-five, or more, would be a decided stimulus to the work. An example has been set by the Federal Government which makes an annual grant to the work of the central offices of the Canadian Branch of the St. John Ambulance Association, and this has been supplemented by the Government of British Columbia, which has recently appropriated \$1,000.00 annually for the extension of the work of the provincial centre.

* *Coal Mines Regulation Act*, 2 Geo. V, Chap. 160, Sec. 41.

† *The Mines Act*, Statutes of Alberta, Chap. 4, Sec 20 ; Clause 5, 1913.

V. Town-planning Conferences

REPORTS BY

CHAS. A. HODGETTS, M.D., D.P.H., ETC.

IN view of the fact that this year Canada will entertain the first International Conference on City-planning, more than ordinary interest attaches to the work of the last National Conference, which was held in Chicago in May, 1913; also to the first City- and Town-planning Conference of the Commonwealth of Massachusetts, held in Boston in November, 1913. Delegates were present from a number of Canadian municipalities. The Medical Adviser of the Commission also attended both Conferences. The following are brief notes on the proceedings of these important congresses:

NATIONAL CITY PLANNING CONFERENCE

Mr. Frederick L. Olmsted, Chairman of the Executive Committee, in discussing "A City-planning Programme," said:

"The realization of a city plan must come through three distinct methods each complementary to the others. Much can be accomplished through the voluntary action of individuals, inspired by the ideals of the plan and impelled by the force of public sentiment. Indeed many of the aims of city-planning are attainable only if such a spirit of idealism is widely felt as a moving force in the community. The second method is by compulsion, by means of the police power, a force which is of the utmost value in dealing with recalcitrant citizens, but which can under no circumstances do more than fix a minimum standard already outstripped by the ideals of the community. The third and most conspicuous method is through the expenditure of public funds raised by taxation, for the acquirement of lands and rights in land and for the construction of public improvements."

In indicating the changes that were necessary in the law of the states as to the powers necessary for a town or city to acquire lands for improvement purposes, Mr. E. M. Bassett, New York, said:

"The needs of urban communities have grown since police powers were limited to public health and safety, and progressive legislation is required, and the city should have the power to impose restrictions on the use of private land so that the communities' needs shall be observed."

The mayor of Philadelphia, Mr. W. A. Magee, discussed "The organization and functions of a City-planning Commission," and stated, that one of its chief functions is to bridge the gap existing between independent public authorities. A City-planning Commis-

sion is the answer to a long felt want in respect to better town-planning and better housing conditions.

REPORT OF COMMITTEE ON LEGISLATION

Perhaps the most interesting feature of the Conference was the report of the Committee on Legislation which presented therein several draft forms of Bills which it considered would facilitate materially the work of city-planning.

The following is a brief description of the several bills :

- (a) An act for the government of cities, creating and regulating a City-planning Department, giving it jurisdiction, extending it over the city and for three miles beyond the city limits, and regulating the laying out of plans of lots within the limits of the city.
- (b) An act relative to taking of remnants of land in certain cases by right of eminent domain.
- (c) An act authorizing cities to acquire land, within or without their limits, for public parks, parkways and playgrounds ; to acquire neighbouring property within 200 feet of property so taken and to re-sell the same with restrictions ; requiring that the proceeds be used for the purchase of private property for parks, parkways and playgrounds ; and providing for compensation for private property taken.
- (d) An act to create metropolitan districts of cities of the first and second classes and the areas within twenty-five miles of the limits thereof, to provide for the appointment of Metropolitan Planning Commissions for such districts, to prescribe their powers and duties, and to provide for their expenses.
- (e) An act to empower cities to create from one to four districts within their limits and to regulate the heights of buildings to be thereafter constructed within each district.
- (f) An act to authorize the plotting by cities of civic centres or parks within their borders.
- (g) An act relating to the plotting of reservations without specifying their proposed use.
- (h) An act relative to the establishment of building lines.

RECOMMENDATION *re* A CANADIAN CONFERENCE

In view of the fact that the International Conference will be held in Toronto in May, 1914, it would appear that the time is opportune for the calling together by the Commission, of the municipal author-

ities of Canada, as well as all others interested, with the object of forming a Canadian Town-planning and Housing Association, which would serve the purpose of arousing public interest and urging the enactment of legislation for the advance of town-planning standards.

This Commission could very properly in the interests of the conservation of the health of all our citizens, and as a material aid in the matter of municipal economy, through its committee on Public Health, collect and disseminate information on all that relates to town-planning.

FIRST CITY AND TOWN PLANNING CONFERENCE OF THE COMMONWEALTH OF MASSACHUSETTS

An invitation having been extended to the Commission of Conservation to send a delegate to the above-mentioned Conference, held in Boston, Mass., Nov. 18-19, 1913, the Medical Adviser of the Committee on Public Health was instructed to attend. Many features of the Conference are of interest to Canadian municipalities as well as to the Provincial Governments.

The state of Massachusetts appointed, in 1911, a Commission which is authorized :

“To continue from time to time its investigations of defective housing ; of the evils resulting therefrom and of the work being done to remedy the same in Massachusetts and elsewhere ; to make studies of the operation of building and tenement house laws ; to encourage the creation of local planning boards, and to gather information relating to city- and town-planning for the use of such boards ; and to increase the supply of wholesome homes for the people.”

The legislature also provided at the same time for the establishment of local planning boards in the cities and large towns of the state, whose duty it shall be to make careful studies of the resources, possibilities and needs of the city or town. This applied particularly to conditions affecting public health in and about rented dwellings ; and also, to the making of plans for the development of better housing.

It will be noted that, while the provisions are excellent as far as they go, they lack, in that they do not provide for the enforcement of plans after defects have been discovered and plans provided.

In Massachusetts there is, as yet, no adequate legislation whereby municipalities can deal efficiently with town-planning and housing, under a proper control by a state administrative body.

TOWN-PLANNING FROM A BUSINESS STANDPOINT

In discussing "Town-planning from a Business Standpoint," Mr. W. C. Ewing pointed out :

"With the development of cities it has become apparent that one of the greatest needs, perhaps the greatest, is for radial thoroughfares connecting the heart of the city with the residential districts. It has been shown that all street developments, whether the community be large or small, should be planned with this in view, every street widening should have a definite relation to the main arteries through which people travel from the business districts to their homes. In this connection there is also a close relationship with street-car service, both surface and sub-surface, while such questions as the location of freight yards where they will necessitate the shortest hauls, the surfacing of streets with the kind of pavement most suitable to the traffic to which they are subjected, the relation of street railway traffic and subways to the steam railroads, with a possible common use of a single right-of-way, must each and all receive due consideration when measured from the standpoint of business efficiency."

Mr. G. H. Cooper, Pittsfield, Mass., spoke of housing and town-planning from a business man's point of view. He asserted that city-planning rightly understood, means bringing all the physical factors of the city steadily and economically up to the highest known standards under the direction of a body of competent experts who, subject to certain legal restrictions, devote themselves solely to the task. These physical factors include harbour terminals, transportation, streets, public and private structures, housing, playgrounds, parks, and civic centres. For every dollar wisely spent in these works two will be gained in permanent value.

HOUSING AND EFFICIENCY

The material improvements to be secured by better housing, in so far as they relate to the health of the inhabitants, were clearly indicated by Mr. J. Ihlder, Field Secretary of the National Housing Association. He centred his remarks upon the home as the place of most influence upon the individual life of each member of the family. It was pointed out that all city-planning is not confined to the present wants of the people, but to those of the future as well. A strong plea was made for the adoption of the individual home, and it was shown that the "three decker" house tends to drive its inhabitants to the streets, the saloons and other places of amusement, thus breaking up the family circle and leading to waste, ignorance, poverty, crime and vice. Each town and city, Mr. Ihlder claimed,

must encourage the single house or cottage, if we are to secure the high standard of human efficiency so essential to material progress.

TOWN-PLANNING ECONOMICS

Economic aspects of town-planning and housing were discussed by Mr. H. Sterling, Secretary of the Homestead Commission of Massachusetts. He said that the Commission had found in studying the economic conditions in the broadest phase that the first thing needed was the systematic planning of the growth of cities and towns, so that overcrowded areas, unsuitable thoroughfares, dangerous, unhealthy tenements, and slums, might be avoided. The absence of forethought in providing for the growth of towns had at times resulted in appalling disasters. The results of carelessness in this regard are told by our mortality rates and criminal records, written in the histories of our slums, and evidenced in the physical and moral conditions of thousands of our people. The work of improving conditions of urban life not only conserves natural resources for the use of future generations, but it conserves the life, health and happiness of the present generation.

TOWN-PLANNING AND COMMUNITY EFFICIENCY

This subject was ably discussed by Dr. J. Ford, of Harvard University, who likened municipal governments to the lower forms of animal life, where life and its activities were directed without any apparent design. Town-planning is a form of scientific management. By it, economy is secured, not increased expenditure, and when wisely administered community efficiency and enhanced local beauty may also be attained.

METHODS OF SECURING IMPROVED HOUSING

Mr. A. C. Comey, a member of the Homestead Commission of Massachusetts, outlined the methods that may be adopted to secure a better class of houses such as are used in England. He classified them as societies under three heads: (1) The Limited Dividend (2) The Homestead Aid, and (3) Co-Partnership Societies. Referring to the latter, he said:

“They are registered under the ‘Provident Societies Act,’ and the capital is of two sorts—share and loan stock. Each resident rents his house from the Society, and must subscribe to a certain amount of stock, but not over \$1,000 in shares may be held by one person. Five per cent dividend is usually paid on the shares, and four to four and one-half per cent on loan stock. The surplus, after paying

for repairs and providing a sinking fund, is credited in capital to each tenant according to the rent he pays, until he holds the value of the house he occupies and after that the surplus is paid in cash. The advantages of this method are capital at a low rate, economy in wholesale operation, responsibility of the tenant in the property and safety from loss in case of removal."

INSURANCE COMPANIES AND HOUSING

Dr. L. K. Frankel described the experiment of the Metropolitan Life Insurance Company, made in 1911, in using its funds for building homes. In that year, the company loaned to a building corporation for the erection of houses in Brooklyn, on mortgage, loans of \$3,250.00 on each of 54 houses, all of which have been sold at \$5,500.00 each. The Insurance Company took a first mortgage of \$3,250.00, payable in twenty annual instalments. A second mortgage of \$1,500.00 was carried by the building corporation, to be payable in instalments covering a period of twelve years.

As an example of how the erection of houses for working men may be aided, the plan of the Goodyear Company of Akron, Ohio, is most instructive. In this case, the Insurance Company took a first mortgage of approximately 50 per cent of the gross cost, the same being re-payable in instalments over a period of fifteen years. The Goodyear Company took the second mortgage for the balance of the cost. No initial payment was required on the part of the purchaser, and the houses were sold to the employees at 25 per cent above the net cost. At the end of five years, the company credits the purchaser with this 25 per cent, so that the house is sold practically at cost.

The site for these buildings is some 400 acres in extent and is situated adjacent to the works of the company. One hundred acres have already been developed and modern ideas of town-planning have been followed carefully.

SCHOOLS, IN RELATION TO TOWN-PLANNING

Both Mr. W. H. Allen, Director of the New York Bureau of Municipal Research, and Mr. C. A. Perry, of the Russell Sage Foundation, dwelt upon the important and close relation existing between the schools and town-planning. The first speaker claimed that school teachers and school boards furnish the direct line of influence on public opinion for town-planning. Any town-plan that does not secure the co-operation of schools will prove "a misfit," while any town-plan understood and encouraged and taught in the schools is much more likely to succeed because it is sure of continuous

explanation and promotion. Amongst the steps practicable in securing this co-operation were mentioned,

(a) Close co-operation between town-planners and school-planners.

(b) Incorporate the idea of town-planning into civic courses. Mr. Perry was of the opinion that adequate provision for play for city children, required as many playgrounds as there are schools, and if separate sites are purchased for playgrounds and schools, there is a needless duplication of expense. By combining the school with the playground site, both institutions would be benefited and one site could be dispensed with. The lavatory and bathing facilities ordinarily found in the shelter of a park or playground, could be provided in the school building, while in the cost of administration much could be saved. The placing of playgrounds adjacent to school-houses makes it possible to carry on more effective work in physical training.

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